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Environmental Laboratory
U.S. Army Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

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333 Market Street
San Francisco, CA 94105-2197

SUMMARY

There is an increased public awareness of the importance of wetlands and a heightened interest in restoration and creation of wetlands using dredged material. Dredged material is being tested for potential use in wetland creation and restoration projects. In order to evaluate the acceptability of wetland creation and restoration with dredged material, establishment of some form of reference wetland baseline from which to make informed evaluations is often necessary. Test data must be interpreted in relationship to realistic circumstances. The reference baseline is usually chosen from the particular location where wetlands will be created or restored.

The objective of this study was to determine the concentrations of contaminants in sediments, plants and animals in existing wetlands near proposed wetland creation sites and to establish a reference wetland baseline for the San Francisco Bay area. The data collected would become an initial wetland baseline that can be used to interpret and put perspective on results of wetland testing of dredged material from the San Francisco Bay area.

Thirteen naturally occurring wetlands were sampled in marine, estuarine and freshwater locations along San Francisco and Suisun Bays and in the Sacramento River Basin. Wetland sediment, plant and animal samples were collected and transported to the U.S. Army Engineer Waterways Experiment Station (WES) for processing and analysis. Samples were analyzed for metals, butyltins, petroleum aromatic hydrocarbons, pesticides and polychlorinated biphenyls.

The naturally-occurring wetlands in the San Francisco Bay area and the adjacent estuarine and freshwater areas contained relatively low levels of most metal, PCBs, PAHs, butyltin, and pesticide contaminants in soil/sediment, plants, and animals. Metals such as lead, chromium and arsenic appeared to have elevated concentrations in some plants and animals. There was a very depauperate faunal component in all the naturally-occurring wetlands surveyed, that may be the result of a more subtle impact. This survey was conducted toward the end of a five year drought in the region. This climatic condition no doubt influenced the existing fauna available for sampling.

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PREFACE

This report presents the results of a field survey of existing wetlands in the San Francisco Bay area performed for Messrs. Brian Walls, Duke Roberts, Mark Dettle and Tom Kendall, project managers at the San Francisco District of the US Army Corps of Engineers. The study was conducted by the US Army Engineer Waterways Experiment Station (WES) during the period July 1990 through September 1991.

Work was performed by Dr. Charles R. Lee, Soil Scientist; Dr. Henry E. Tatem, Zoologist; Dr. John W. Simmers, Research Biologist; Mr. Richard A. Price, Research Agronomist; Mr. Dennis L. Brandon, Statistician; Contaminant Mobility and Regulatory Criteria Group (CMRCG), Environmental Processes and Effects Division (EPED), Environmental Laboratory (EL); and Mr. Scott P. Miner, Ecologist, San Francisco District, U.S. Army Corps of Engineers (SPN).

Animal bioassessment acknowledges Mr. Lawrence Bird (ASCI Corporation), and Ms. Heather Holifield, Mr. Michael Pendarvis, and Mr. Johnny McGuffie (University Contract Students) for conducting the laboratory portion of this study. Plant bioassessment acknowledges Ms. Erika Seals and Ms. Elizabeth Tominey (University Contract Students) for laboratory processing and analysis of sediment and plant tissue. Heavy metals analyses of samples from the plant bioassay were provided by the Analytical Laboratory Group, Environmental Engineering Division, USAE-WES, Vicksburg, Mississippi. All other chemical analyses of sediment, water, and tissues were performed by Dr. Eric Crecelius, Battelle/Marine Sciences Laboratory, Sequim, WA.

At the time of the study, work was conducted under the supervision of Dr. Bobby L. Folsom, Jr., Chief, CMRCG; Mr. Donald L. Robey, Chief, EPED; Dr. John Harrison, Chief, EL, and Mr. Roderick A. Chisholm II, Chief, Environmental Branch, SPN.

At the time of the study, COL Larry Fulton, EN, was Commander and Director during the preparation of this report. Technical Director was Dr. Robert W. Whalin.

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I. INTRODUCTION

Background

Each year the Corps of Engineers dredges sediment from harbors and channels throughout the San Francisco Bay Area to maintain navigation and commerce. Productive use of dredged material to restore and create wetlands has gained more interest in recent years. Suitable dredged material has been used productively in over 120 locations across the U. S. (US Army EM-1110-2-5026). The importance of wetlands to the productivity of estuaries has been realized even more recently in the San Francisco Bay Area. A heightened public interest has emerged to restore wetland acreage that has dwindled away over the past 50 years. Consequently, there has been increased public desire to create and restore wetlands in the San Francisco Bay area in recent years. Dredged material was thought to be of potential value in wetland creation or restoration.

Purpose and Scope

The purpose of this report is to describe the results of a field survey of existing wetland sites in the San Francisco Bay Area and to establish a wetland baseline data set.

Objectives

The objectives of the survey were:

1) to identify relatively undisturbed wetlands typical of the San Francisco Bay area;

2) to collect samples of the dominant plants, animals (where present) and wetland soil from selected marine and estuarine wetlands in the vicinity of San Francisco Bay;

3) to analyze each plant tissue, animal tissue, and soil sample for the presence of contaminants, including toxic heavy metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and butyltin compounds such as Tributyltin (TBT);

4) to document the location and appearance of each of the sampling sites for future reference by map location and through aerial photographs.

II. FIELD SURVEY

Approach

The interpretation of the results of biological and chemical testing of a sediment to evaluate its potential use in wetland creation requires a yardstick (i.e. reference database) for comparison. For this reason, naturally-occurring wetlands in the San Francisco Bay area were identified and the soil/sediment and the indigenous plant and animal communities were sampled. In coordination with personnel of the USACE San Francisco District, sites were selected that are considered to be typical undisturbed wetlands by the District and the Federal and State resource agencies. Unfortunately, since settlement, the San Francisco Bay Area has been the source of anthropomorphic disturbance that has resulted in both modification of the pre-settlement landscape and the introduction of numerous plant and animal species. As a result, it is not always possible to locate the desired species or a sufficient biomass of the desired species for analysis. During the summer of 1990, when the field survey was conducted, animal species, live populations of bivalve mollusks in particular, were not present in either the marine or estuarine wetlands. The paucity of animals has certainly limited the comparative value of the following survey, however, the plant and sediment/soil collections do provide a suitable data base for the establishment of a baseline for wetlands in the San Francisco Bay Area comparison with the species employed in the mesocosm test procedures.

Methods and Materials

Site Selection. The initial selection of the wetlands to be considered was provided by the USACE San Francisco District personnel and consisted of wetlands selected within known wetland refuges and locations generally thought to have been little affected by anthropomorphic activities during recent years, or as in the case of Site 8, the disturbance was well documented and the site was of

interest to the District.

The potential sites were surveyed from the air and if there were no obvious reasons to reject the site, such as proximity to industrial activity, a location within the site was selected for the field sampling (Figure II-1). On several occasions if the helicopter employed by the field collection personnel was not able to land, if the field crew was not able to reach a suitable plant community due to dense vegetation once landed, or if the appropriate plant species were not present, the collection site was relocated as required.

Plant and Animal Identification. Plants and animals collected were identified using appropriate resource materials and reports such as Fernald (1950), Josselyn (1983), and Gosner (1979). Where appropriate, local botanists were consulted to confirm the plant identifications in the field.

Field Collection Technique. Locations of field collections, water salinity, and plant and animal species collected are given in Table II-1. In the marine wetland areas *Spartina foliosa* and *Salicornia subterminalis* were the predominate species. *Spartina* was collected from the low marsh (nearest the water) and *Salicornia* was collected from the high marsh (the zone inland from the *Spartina*). In general, two samples of *Spartina* labeled A and B were collected from the intertidal, low marsh and two samples of *Salicornia* labeled C and D were collected from the more upland, high marsh. In the estuarine and fresh water areas of the survey, the dominant low and high marsh plants were collected as before, labels A and B designated low marsh and C and D designated high marsh. Due to the variability of the less marine habitats, plant species varied between *Typha*, *Scirpus*, and *Salicornia*, depending on the wetland area. Each sample collected consisted of the amount of plant material that could be encompassed by a 28.7-cm square made from a folding carpenter's ruler, or 823.7 cm^2. The plants were clipped 5 cm above the ground. Plant material from each sample was placed in a Ziploc bag or a trash can liner, depending on the amount of vegetation, and placed on ice for shipment to the WES.

After the plants were collected a soil sample of the surface material was collected from each of the sampling locations, A-D. Soil samples were placed in Ziploc bags and placed on ice for shipment to WES. A refractometer was used to measure the salinity of the water.

Any animals suitable as sentinel species were collected at each field collection site. Animal collections represent a composite sample rather than two discrete points within the field site. When a single species was found in sufficient numbers to provide appropriate biomass for chemical analysis, the animals were collected, placed in Ziploc bags and placed on ice for shipment to WES.

At each site the location was plotted on a map (Figures II-2, II-3, and II-4) and an aerial photograph was made of the site, looking north at 30- to 45-m altitude (Figure II-5 - II-16).

Laboratory Procedures. Plant, animal, and soil samples were shipped and stored at 4°C until processed. The plant leaf samples were rinsed three times in reverse osmosis (RO) purified water blotted with paper towels, and weighed. Animal sentinel species (mollusks) were rinsed in RO water and the soft tissues removed from the shells. Only the soft tissues were submitted for chemical analysis. Soil samples were composited to form one sample from each field site. Plant tissue, animal tissue, and soils were placed in acid-washed, hexane-rinsed glassware and shipped at 4°C to Battelle Pacific Northwest Laboratory for chemical analysis. Freeze dried and ground sediment samples were analyzed by energy dispersive X-ray fluorescence for As, Cr, Cu, Ni, Pb and Zn (Nielson and Sanders 1983). The other metals were analyzed by atomic absorption spectrometry (AA) after the sediment was totally dissolved in a mixture of nitric, perchloric and hydrofluoric acids at an elevated temperature (130 degrees C) in a sealed Teflon container. Mercury was quantified by cold vapor atomic absorption spectrometry and the other metals (Ag, Cd and Sb) were quantified by Zeeman graphite furnace AA with matrix modifiers. Sediment and tissue samples were extracted with a mixture of methylene chloride, tropolone and sodium sulfate for

the Tributyltin (TBT) analyses. The extract was derivatized and analyzed by gas chromatography with a flame photometric detector (GC-FPD) similar to the method of Ungery et al. (1986). Sediments were analyzed for base-neutral acids using US EPA Method 625, which indicates solvent extraction, column cleanup and the quantification by GC/MS. The PCBs and DDT were analyzed by US EPA Method 8080 which quantified by GC-ECD. Volatiles were analyzed by US EPA Method 624 using GC/MS. All samples for tributyltin analyses were placed in hexane rinsed and oven-dried amber glass containers and frozen prior to shipping.

Figure II-1. Sampling was Accomplished by Helicopter.

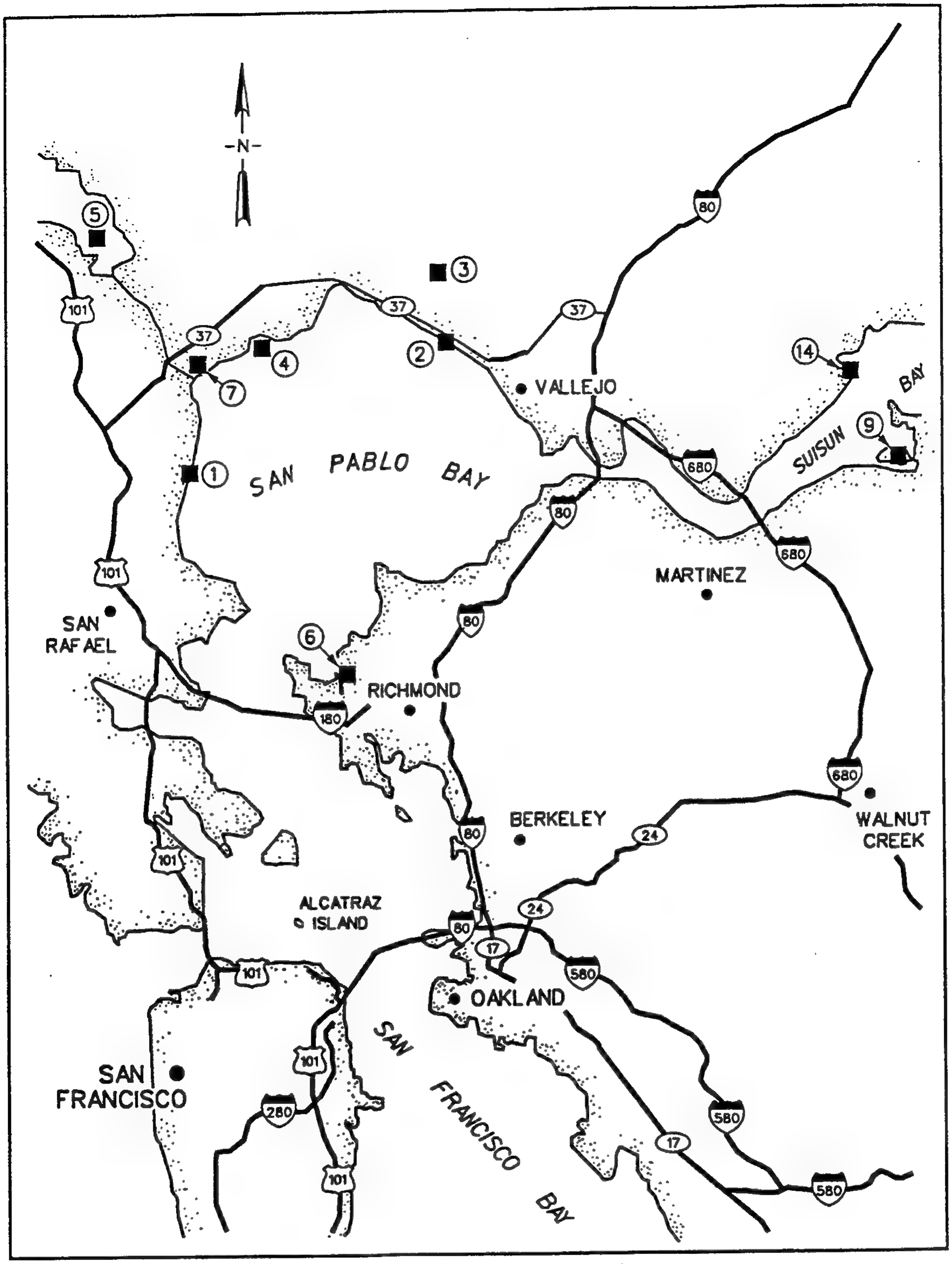

Figure II-2. Field Survey Map for Sites 1-7, 9, and 14.

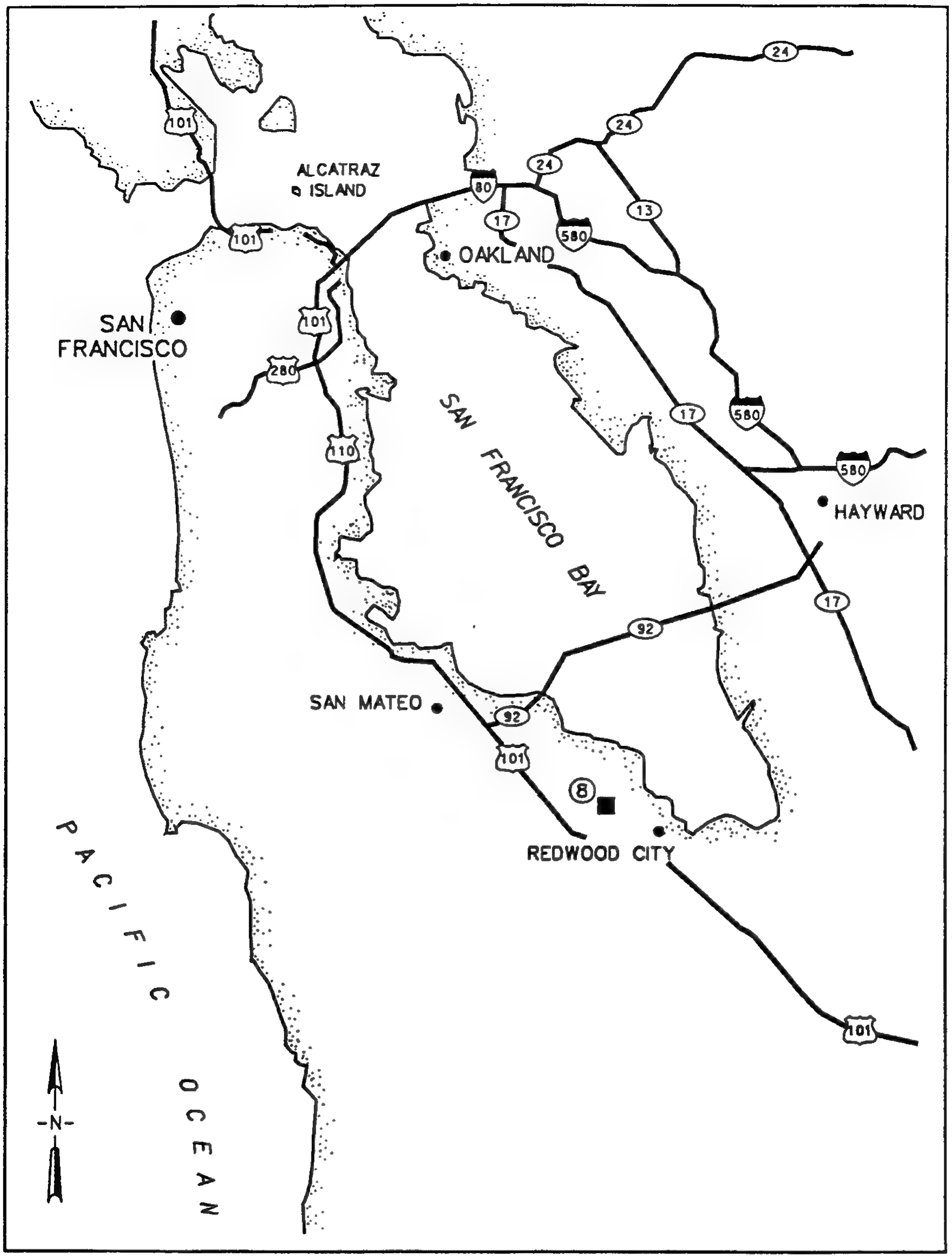

Figure II-3. Field Survey Map for Site 8.

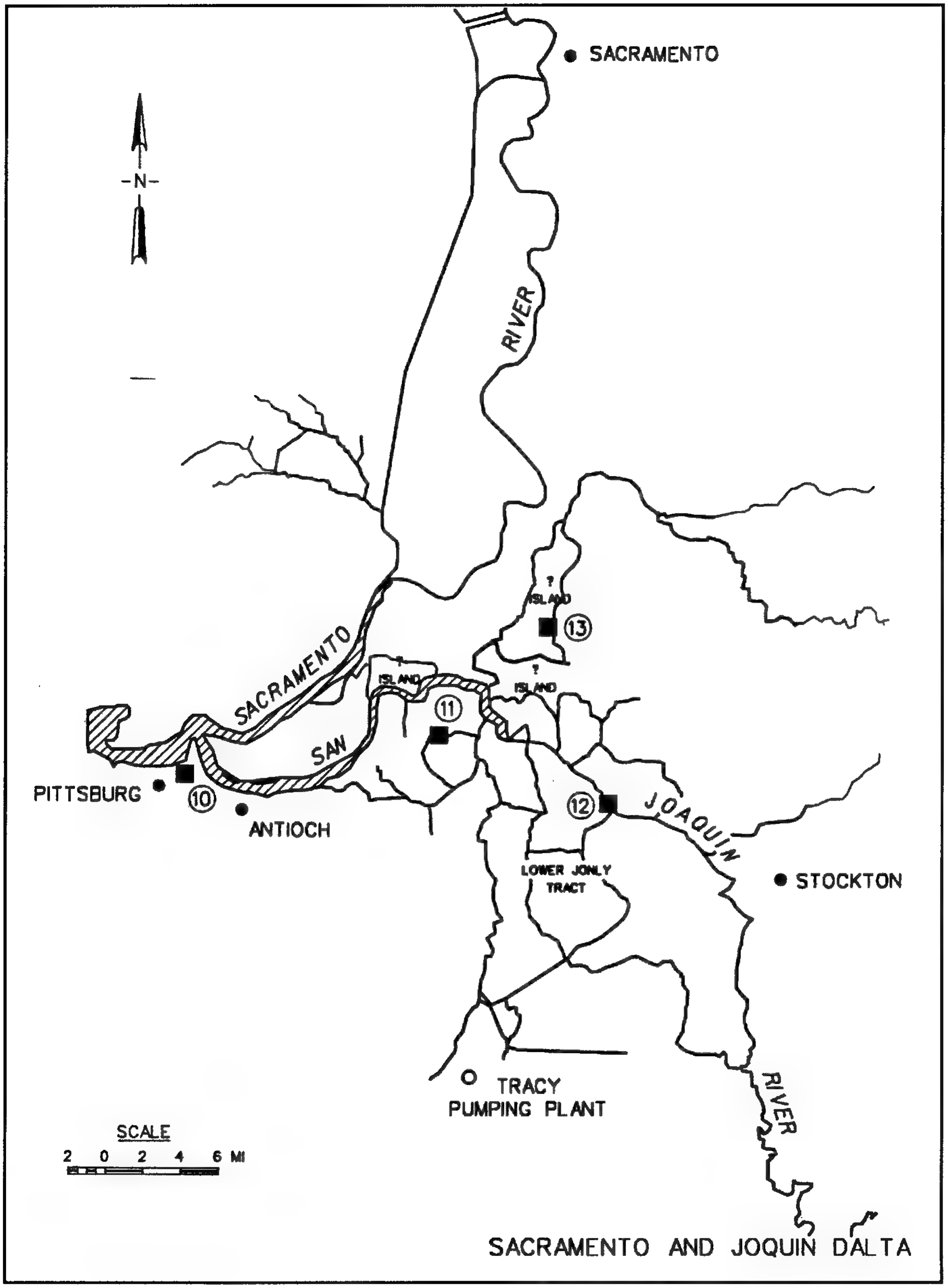

Figure II-4. Field Survey Map for Sites 10-13.

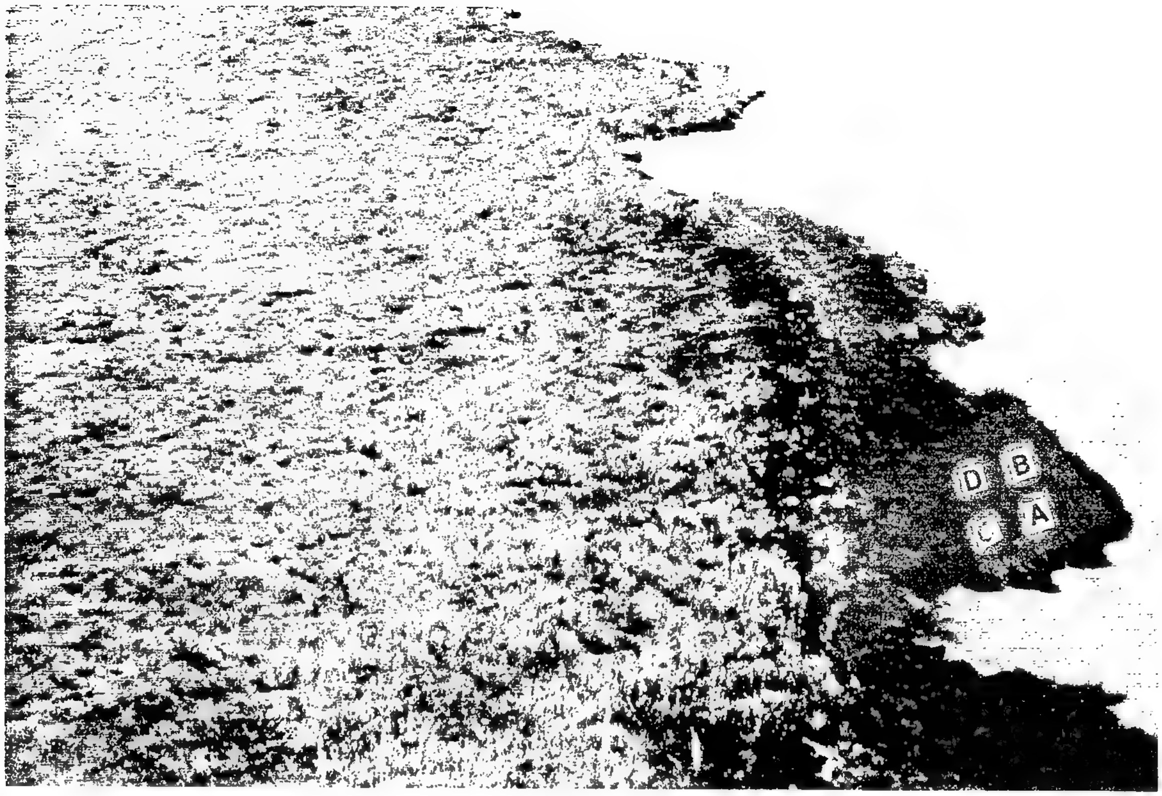

Figure II-5. Field Sampling Site 1 Hamilton Air Force Base (Reference)

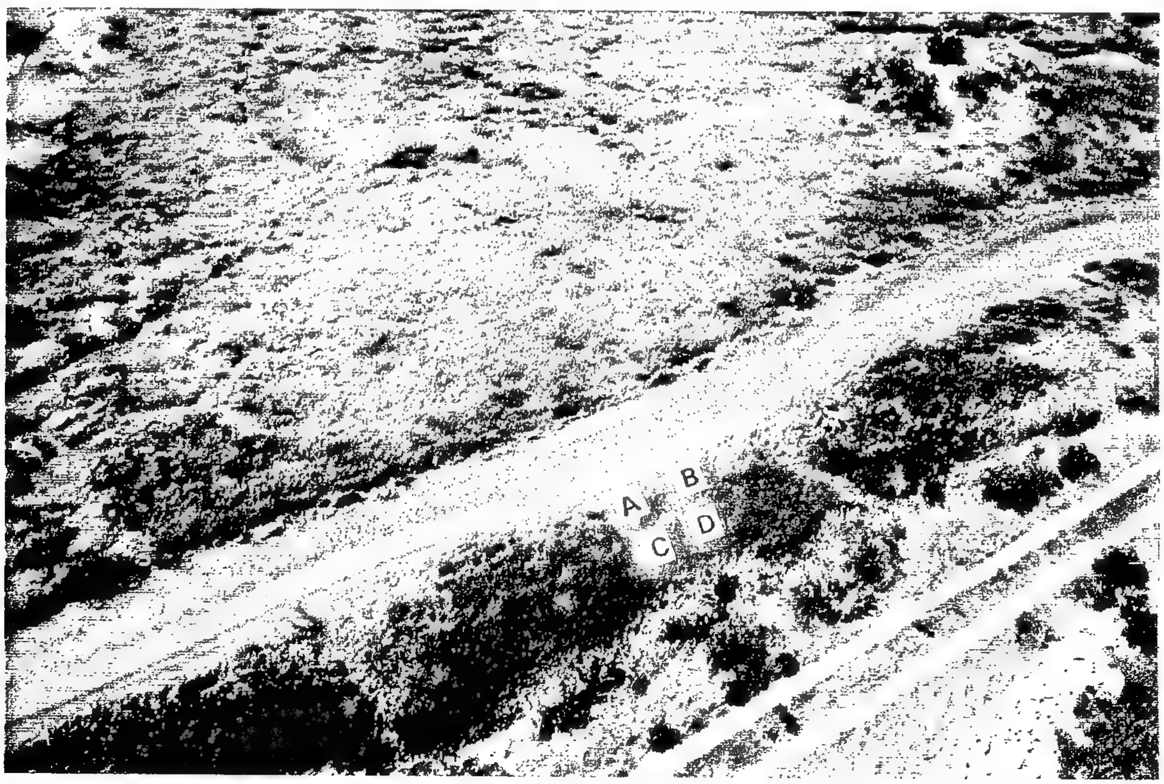

Figure II-6. Field Sampling Site 2 Sears Point Road/ Cullinan Ranch

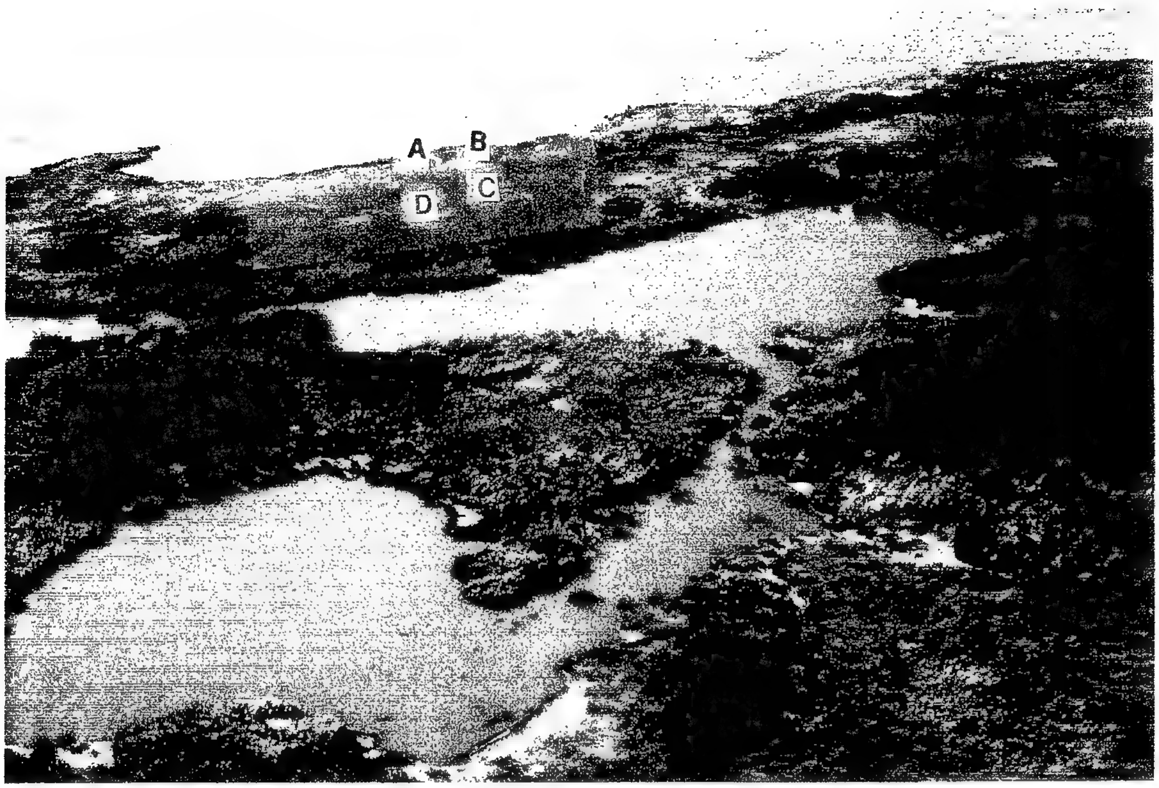

Figure II-7. Field Sampling Site 3 Dutchman Slough/ Cullinan Ranch

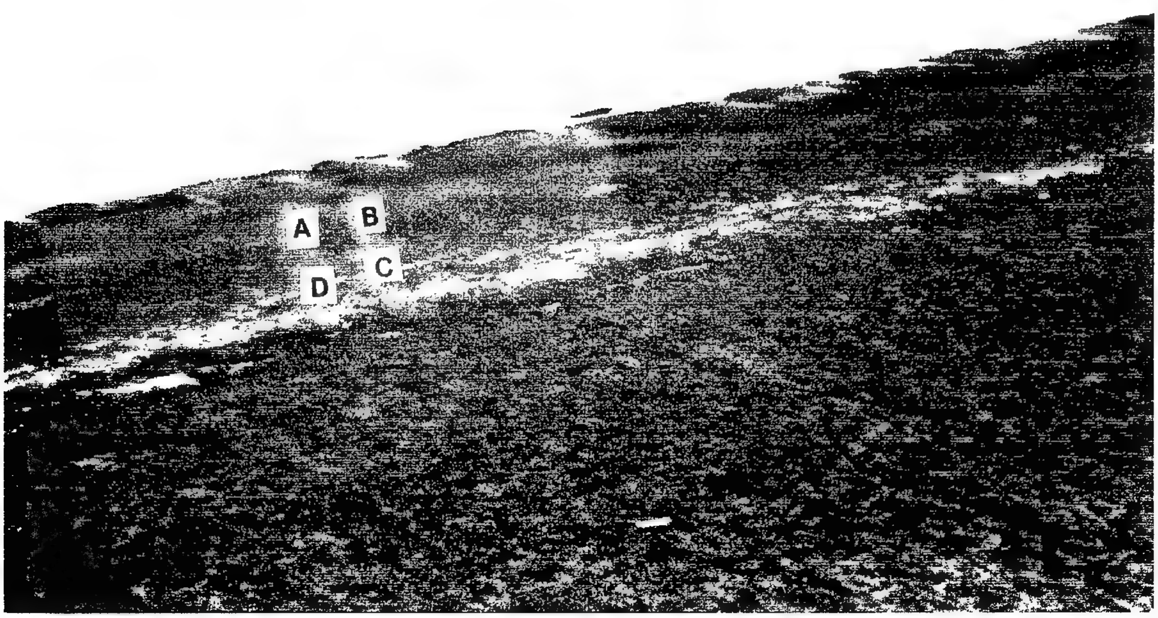

Figure II-8. Field Sampling Site 4 Lower Tubbs Island Wetland

Figure II-9. Field Sampling Site 5 Petaluma Marsh

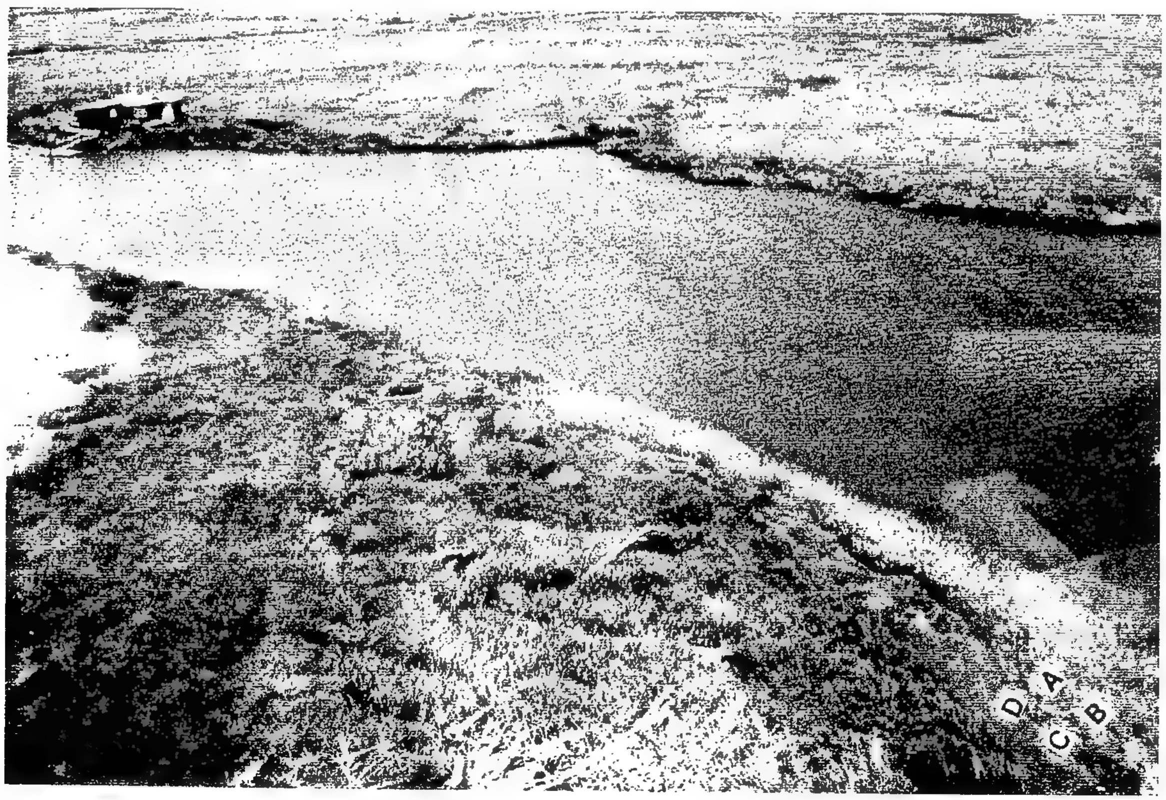

Figure II-10. Field Sampling Site 7 Sonoma Baylands

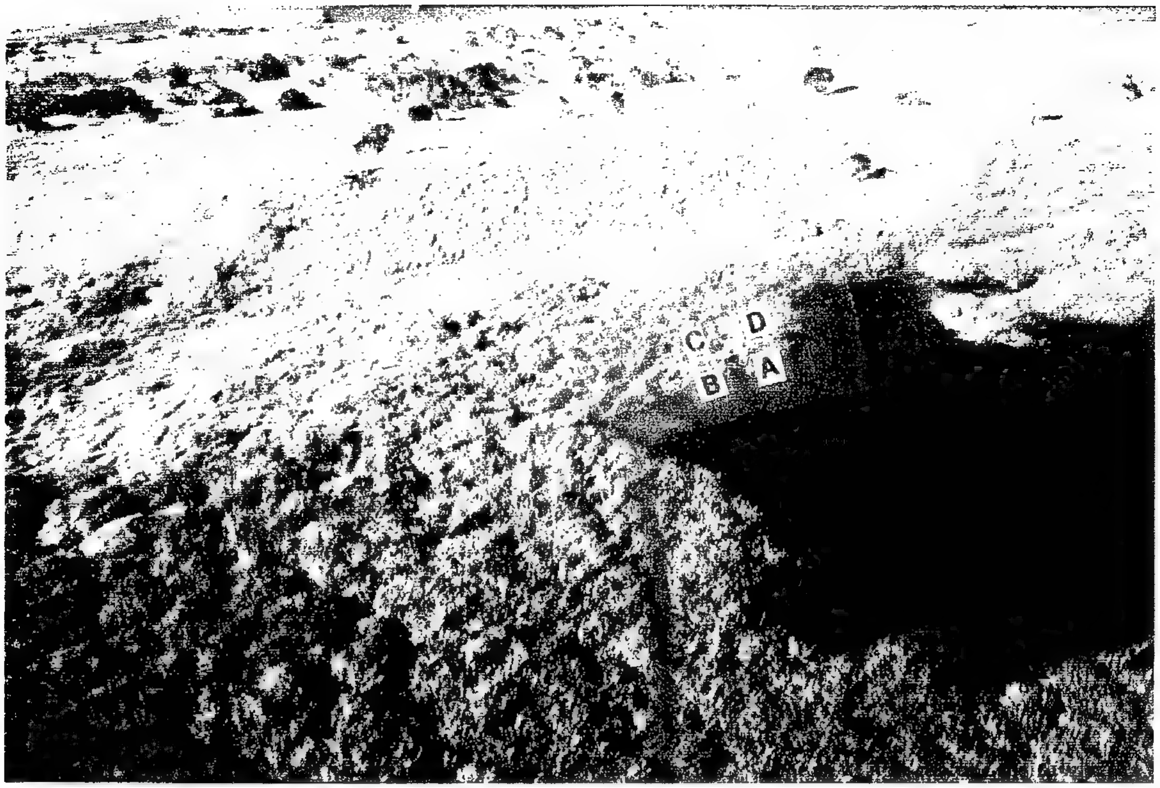

Figure II-11. Field Sampling Site 8 Deepwater Slough

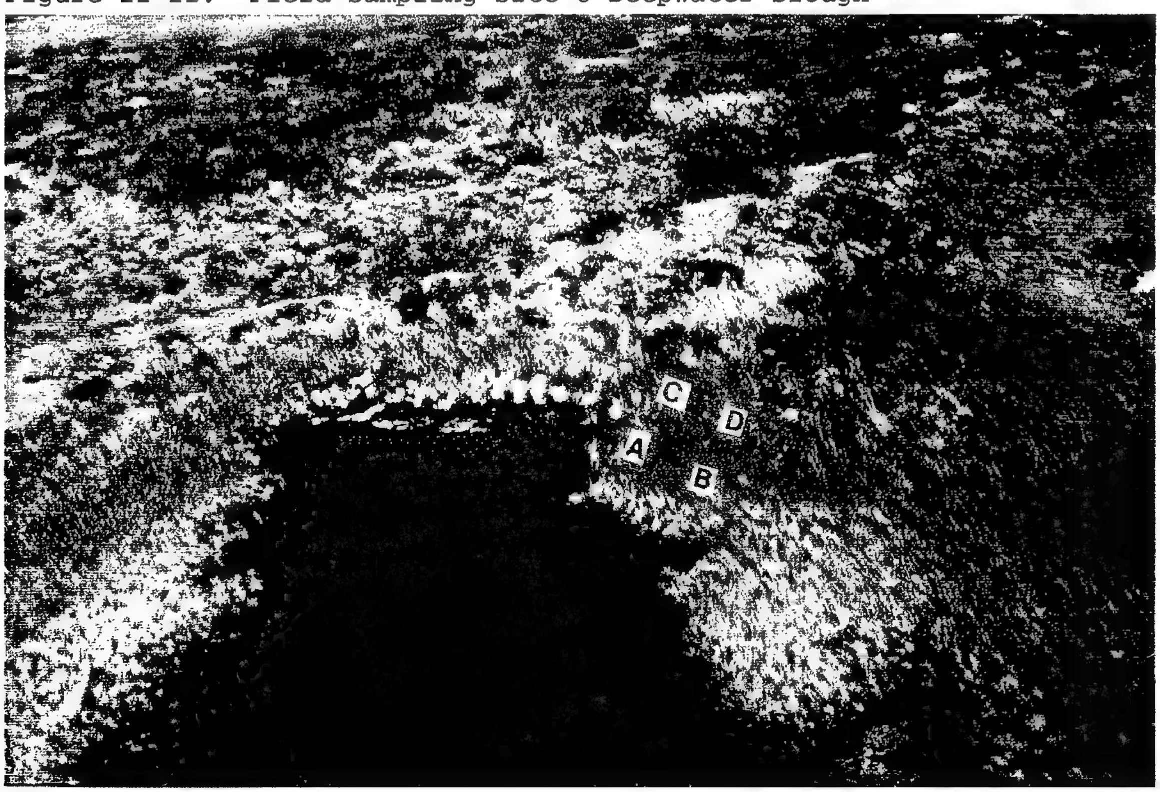

Figure II-12. Field Sampling Site 9 Roe Island, NWS Concord

Figure II-13. Field Sampling Site 10 Browns Island

Figure II-14. Field Sampling Site 11 Near Franks Tract

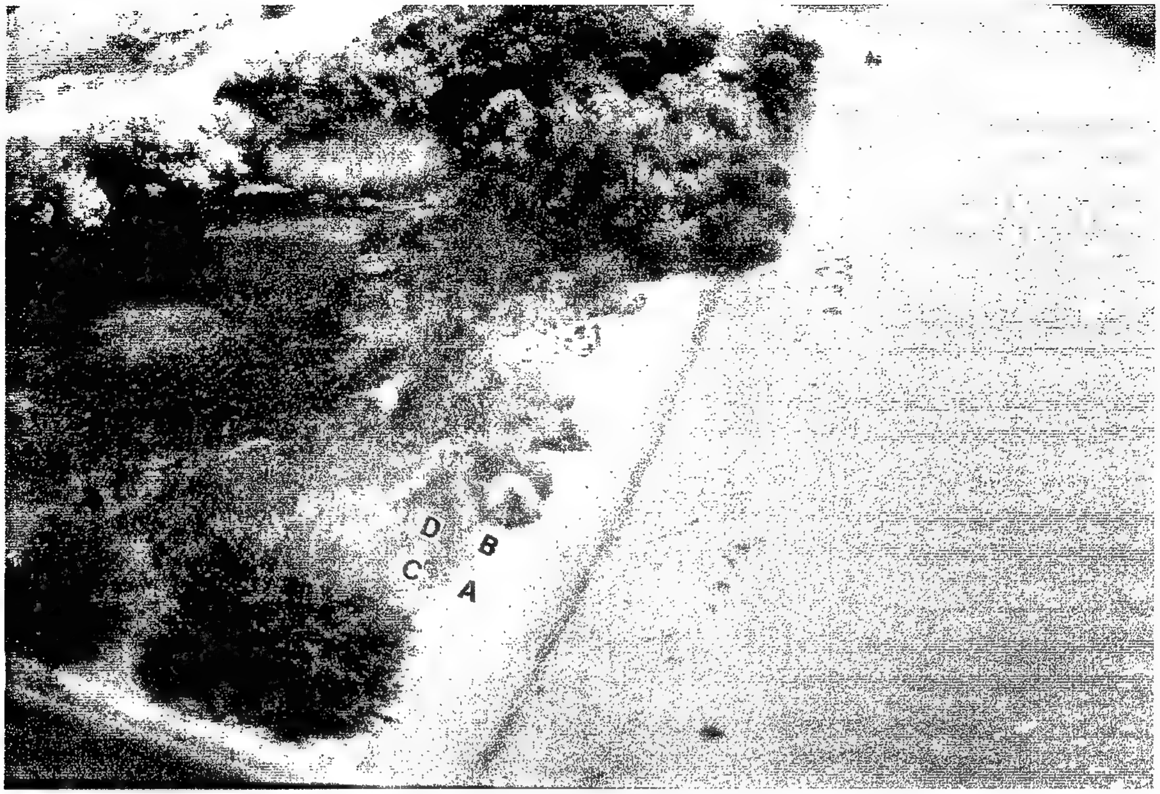

Figure II-15. Field Sampling Site 13 Staton Island, South Fork

Figure II-16. Field Sampling Site 14 Suisun Slough (Reference)

Results and Discussion

Chemical Analysis. Results of the analyses for metal, butyltin, PAH, PCB, and pesticide contaminants are shown in Tables II-2 through II-6. Metal concentrations (Table II-3) represent naturally-occurring background levels for the enormous San Francisco Bay area. These levels of metals result from the presence of heavy metals in the earth's crust, water borne metals, metals in tide water and any atmospheric fallout. These data represent areas thought to be relatively undisturbed, and uncontaminated by agricultural or industrial activities (Site 8 however, was the only disturbed site that had been created from dredged material). While the sediment arsenic concentrations are relatively low and range up to 23.7 mg/kg for site 1 and plant tissue contents are at or below detection limits, those few animals collected had tissue arsenic concentrations approaching or at a FDA-type tissue arsenic content of 10 ug/g (dry weight basis) for mollusks and crustacea used by Australia (Lee et al. 1991). While the few animals sampled in this field survey did not show elevated levels of chromium, zinc or lead, snails collected from the Tiburon area and used in wetland bioassays of dredged material from Oakland Harbor and J. F. Baldwin Ship Channel showed levels of chromium up to 74.9 ug/g, zinc up to 797 ug/g and lead up to 31.6 ug/g (Lee et al. 1994). These bioassays were conducted at the same time of the Field Survey and indicate that chromium, zinc and lead concentrations in certain native wetland animals may be elevated in the San Francisco Bay area. Of particular concern is the lead levels that appear to approach and exceed the 25 ug/g lead concentration established in Australia for human consumption of mollusc. Both Spartina and Salicornia plant species collected during the Field Survey showed tissue lead concentrations up to 4.9 and 5.4 ug/g, respectively. These values approach and exceed the 5.0 ug/g concentration established by the Dutch for mixed animal feed (van Driel et al. 1985). These data suggest that lead contents of some wetland plants and certain wetland animals in existing wetlands may be of concern to the foodwebs associated with these sites in the San Francisco Bay area. The presence of copper at what may appear to be an elevated level in the animals collected at the field sites is likely related to the copper-containing respiratory pigment

characteristic of the Mollusca as a group. The butyltin levels are generally near or below detection limits with the exception of tributyltin in bivalve mollusks (Table II-2). Butyltin values in boldface print are above detection limits. Modiolus collected at Site 1 contained 34.9-38.3 ug/kg tributyltin and Corbicula collected at Site 13 contained 40.7 ug/kg. These levels are the highest determined in any survey animals and probably reflect trace amounts accumulated from the water filtered by these mollusks. Since butyltins do not exist in nature, the levels reported are assumed to be the result of contamination from marine antifouling coatings. PCBs were not found above the detection limits with the exception of some trace amounts of Aroclor 1254 in the wetland soils collected at Sites 1-4 (Table II-4). As noted for butyltin compounds, PCBs are not found naturally in the environment and their presence above detection limits indicates some anthropomorphic contamination. The presence of some PAHs at levels greater than detection in the wetland soils at some sites may also be indicative of anthropomorphic influences (Table II-5). Those PAHs indicated in boldface print are above the detection limits but at the same time they are still relatively low and generally do not exceed 50-100 ug/kg. Pesticides were notably below detection limits with only a few exceptions (boldfaced in Table II-6).

The naturally-occurring wetlands in the San Francisco region that were selected for this survey appeared to be relatively uncontaminated by post-settlement agriculture and industrialization. Even Site 8 constructed on dredged material contained only low levels of the contaminants evaluated. Arsenic tissue contents observed in the few animals collected appeared to be close or at the action level established in Australia for mollusks and crustacea. Further study of arsenic in wetland foodwebs in the San Francisco Bay area appears to be warranted. Likewise, some wetland plants and animals were observed to contain elevated levels of chromium, zinc and/or lead. Lead particularly was observed to approach and exceed tissue lead contents established for plant feed mixes by the Dutch and lead concentrations in mollusks established by the Australian. Further evaluation of chromium, zinc and lead in existing wetlands of San Francisco Bay appears to be warranted.

Although the levels of anthropomorphic contaminants appear to be low, all the selected sites were characterized by a lack of animals, particularly those that could have been used as sentinel species. All the marine sites were characterized by the dead remains of what must have only recently been extensive beds of ribbed mussels. Although the plant communities have survived, there is a need to at least develop a plausible explanation for the lack of living mussels. The introduction and proliferation of a tiny exotic clam from Asia, *Potamocorbula amurensis* may be a contributing factor. This species out-competes and is a more efficient feeder than existing species. In the brackish and freshwater sites, the clam *Corbicula* was represented also by many shells and only a few live animals. The invasion of *Potamocorbula amurensis* also includes brackish waters such as in Suisun Bay. Snails were equally scarce on all sites but Site 8. This lack of animals is quite peculiar since the snails, and mussels are invasive species from the U. S. East Coast, and the clams are an equally opportunistic species from Asia. While it is likely that the introduction of the exotic species (*Nassarius*, *Modiolus*, and *Corbicula*) accompanied some disturbance of the California wetlands, these are very hardy species and would have been expected to survive subsequent disturbances. However, *Potamocorbula amurensis* could even be out-competing these species. It is realized that the entire San Francisco Bay area has suffered from an extensive drought over the past five years and could have contributed to the observation of few live animal species in the wetlands sampled. Likewise, the faunal component of San Francisco Bay wetlands is not well documented and perhaps the fauna may not be particularly diverse or abundant in the West Coast wetlands.

Table II-1. Wetland Field Survey Site List of Samples Collected.

Site	Location	Samples
1	Hamilton Air Force Base/Antenna Field Natural saltmarsh, 26 ppt. Selected as reference marsh for laboratory tests	Spartina foliosa (2)+ Salicornia sp. (2) Mussels (1) Soil (4)
2	Sears Point Road, adjacent to Cullinan Ranch, recent accreted sediment salt marsh, 30 ppt	Spartina foliosa (2) Salicornia sp. (2) Soil (4)
3	Dutchman Slough, adjacent to Cullinan Ranch, natural salt/brackish marsh, 22 ppt	Spartina foliosa (2) Salicornia sp. (2) Soil (4)
4	Lower Tubbs Island, natural salt marsh 29 ppt	Spartina foliosa (2) Salicornia sp. (2) Soil (4)
5	Petaluma Marsh, natural brackish marsh 27 ppt	Spartina foliosa (2) Salicornia sp. (2) Soil (4)
6	Castro Cove, natural salt marsh,	no permission
7	Sonoma Baylands, natural salt marsh, adjacent to potential restoration site 32 ppt	Spartina foliosa (2) Salicornia sp. (2) Soil (4)
8	Deepwater Slough, salt marsh on dredged material, some contamination, 45 ppt	Salicornia sp. (4) Snails (1) Soil (4)
9	Roe Island, NWS Concord, natural brackish marsh, 8 ppt	Scirpus sp. (4) Soil (4)
10	Browns Island, natural brackish marsh, 4 ppt	Typha sp. (4) Soil (4)
11	Near Franks Tract, natural freshwater marsh, a potential restoration site, <2 ppt	Scirpus sp. (4) Soil (4)
12	San Joaquin River, natural freshwater marsh, between Rindge & McDonald tracts	omitted
13	Staton Island, on South Fork, below Brack tract, freshwater marsh, 0 ppt	Typha sp. (4) Corbicula sp. (1) Soil (4)
14	Suisun Slough, natural brackish marsh, 10-12 ppt, selected as reference marsh for laboratory tests	Scirpus sp. (2) Salicornia sp. (2) Soil (4)

+ number of samples

Table II-2. Butyltin Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg dry-weight)

Site		Tetrabutyl Tin	Tributyl Tin	Dibutyl Tin	Monobutyl Tin
1	Soil	<1.3	2.3	<1.4	<1.3
	Plants				
	Spartina a	<4.7	9.2	<4.3	19.8
	Spartina b	<3.3	<3.7	<3.1	<3.1
	Salicornia c	<1.6	<1.8	<1.5	<1.5
	Salicornia d	<3.2	7.4	<2.9	21.1
	Animals				
	Modiolus R1	<3.9	34.9	9.3	7.8
	Modiolus R2	<5.0	38.3	<5.0	<4.6
2	Soil	0.5	2.6	3.6	17.0
	Plants				
	Spartina a	<2.3	<2.5	<2.2	<2.2
	Spartina b	<3.1	<3.4	<2.9	<2.9
	Salicornia c	9.7	6.5	<3.5	7.1
	Salicornia d	<3.2	7.4*	<2.9	12.5*
3	Soil	3.0	2.6	<1.4	2.9
	Plants				
	Spartina a	<2.1	2.9	<2.1	<1.9
	Spartina b	<3.6	8.3	3.7	5.1
	Salicornia c	2.2	3.1	6.6	15.6
	Salicornia d	3.3	4.8	4.4	7.1
4	Soil	<1.4	3.1	2.0	2.3
	Plants				
	Spartina a	2.7	5.2	2.5	NA
	Spartina b	<4.2	<4.6	<3.9	<3.9
	Salicornia c	3.2	6.0	19.0	64.3
	Salicornia d	<3.2	7.0*	<2.9	17.6
5	Soil	<1.2	3.1	1.7	<1.2
	Plants				
	Spartina a	<2.2	5.2	<2.2	<2.0
	Salicornia c	<2.9	6.0*	<2.7	18.1
	Salicornia d	54.7	35.8	2.3	5.3
7	Soil	2.9	2.0	9.6	2.1
	Plants				
	Spartina a	<4.1	<4.4	<3.8	<3.8
	Spartina b	<3.3	<3.6	<3.1	<3.1
	Salicornia c	8.2	9.6*	5.6	6.1
	Salicornia d	<5.8	12.6*	13.2	<5.3
8	Soil	2.0	2.3	<1.4	<1.3
	Salicornia a	2.4	4.5	2.2	53.5
	Salicornia b	<3.1	5.3	<3.1	<2.9
	Salicornia c	2.0	3.5	11.1	24.6
	Salicornia d	<2.3	4.0	2.8	2.1
	Animals				
	Cerithidea?	<1.4	3.5	4.2	1.7
	Cerithidea?	<0.6	1.4	0.9	1.6

Table II-2 Concluded. Butyltin Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg dry-weight)

Site		Tetrabutyl Tin	Tributyl Tin	Dibutyl Tin	Monobutyl Tin
9	Soil	<1.9	3.2	9.6	2.1
	Plants				
	Scirpus a	6.1	8.3*	4.6	4.3
	Scirpus b	<3.2	6.5*	<2.9	<2.9
	Scirpus c	<3.8	8.4*	3.6	5.0
	Scirpus d	<5.1	14.7*	6.7	<4.6
10	Soil	<1.5	3.6	<1.6	4.7
	Plants				
	Typha a	11.4*	4.7*	2.5*	9.5*
	Typha b	6.1*	5.7*	3.0*	4.1*
	Typha c	11.0*	3.9*	2.8*	<2.2
	Typha d	6.3*	2.2*	3.7*	14.0*
11	Soil	<0.9	33.4	<0.9	<0.9
	Plants				
	Scirpus a	<4.1	5.6	5.6	<3.7
	Scirpus b	5.5	5.2	2.6	9.5
	Scirpus c	<2.2	4.1	<2.1	4.4
13	Soil	<0.9	1.8	<0.9	<0.9
	Plants				
	Typha a	13.1*	8.4*	4.4*	7.0*
	Typha b	14.7*	6.8*	4.1*	5.5*
	Typha c	<3.2	<3.6	<3.0	<3.0
	Typha d	18.3*	4.3*	2.3*	3.3*
	Animals				
	Corbicula	14.6	40.7	30.1	11.8
14	Soil	<1.3	3.5	1.8	2.4
	Plants				
	Scirpus a	1.2	2.2	1.1	NA
	Salicornia c	2.4	4.8	2.2	35.1
	Salicornia d	<3.1	4.4	<3.0	5.6

* indicates analyte detected in the blank

Table II-3. Heavy Metal Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in mg/kg dry-weight)

Site		As	Cr	Cu	Ni	Pb	Se	Zn	Cd	Hg
1	Soil	23.7	174.0	71.6	102.0	36.3	0.33	137.2	0.33	0.515
	Plants									
	Spartina a	<0.96	<4.7	4.63	1.96	4.1	<0.74	27.6	0.055	0.006
	Spartina b	<0.86	7.1	4.35	4.34	2.2	<0.64	21.2	0.032	0.015
	Salicornia c	<1.0	4.2	7.92	3.07	4.1	<0.77	18.0	0.051	0.01
	Salicornia d	0.94	<3.7	10.45	2.71	<2.4	<0.70	16.6	0.069	0.012
	Animals									
	Modiolus R1	8.76	4.0	23.1	7.74	1.71	4.19	71.7	3.53	0.398
	Modiolus R2	8.93	3.3	20.5	5.33	1.39	3.52	71.1	3.45	0.304
2	Soil	18.5	219.0	90.6	125.4	36.8	0.33	158.9	0.32	0.469
	Plants									
	Spartina a	<1.2	8.9	6.44	4.61	3.0	0.85	30.5	0.063	0.02
	Spartina b	<1.1	<6.3	7.2	4.11	4.7	<0.76	34.8	0.066	0.02
	Salicornia c	<0.91	1.8	10.8	2.47	0.61	<2.20	40.0	0.16	0.019
	Salicornia d	<1.1	10.6	13.9	6.07	3.9	<0.78	31.5	0.089	0.022
3	Soil	18.2	179.0	70.1	145.2	33.0	0.42	166.1	0.41	0.166
	Plants									
	Spartina a	1.27	7.2	13.7	8.76	1.39	<0.63	98.0	0.06	0.022
	Spartina b	1.04	7.7	13.9	9.29	1.84	<0.64	84.9	0.12	0.025
	Salicornia c	1.0	1.8	8.0	3.31	0.66	<0.65	26.6	0.05	0.016
	Salicornia d	<0.86	2.6	12.0	5.27	0.93	<0.64	25.8	0.08	0.021
4	Soil	13.4	214.0	72.6	135.5	35.7	0.17	160.1	0.31	0.439
	Plants									
	Spartina a	1.82	2.5	8.9	2.05	0.60	<0.68	60.9	0.07	0.014
	Spartina b	<1.2	<6.9	6.43	3.24	4.9	<0.85	25.9	0.043	0.012
	Salicornia c	<1.0	5.9	19.1	6.29	1.42	<0.79	45.7	0.29	0.038
	Salicornia d	<0.76	4.6	6.52	1.66	<2.10	<0.63	12.04	0.094	0.014
5	Soil	14.4	179.0	67.6	125.9	34.1	0.25	158.4	0.26	0.419
	Plants									
	Spartina a	0.99	8.5	11.4	9.1	2.04	<0.65	65.5	0.08	0.027
	Spartina b	<1.1	<5.1	8.86	3.29	<2.7	<0.81	44.9	0.22	0.008
	Salicornia c	<0.62	6.8	8.68	5.66	2.80	<0.65	15.7	0.039	0.012
	Salicornia d	<0.88	4.1	11.5	4.49	4.49	<0.66	44.3	0.06	0.018

Table II-3. Continued. Heavy Metal Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in mg/kg dry-weight)

Site		As	Cr	Cu	Ni	Pb	Se	Zn	Cd	Hg
7	Soil	10.6	195.0	67.5	119.8	33.8	0.33	157.5	0.33	0.469
	Plants									
	Spartina a	<1.1	<6.0	4.64	4.29	3.6	<0.79	28.5	0.043	0.009
	Spartina b	<0.99	8.9	6.1	7.40	2.7	<0.72	25.5	0.064	0.017
	Salicornia c	1.14	6.6	8.79	5.37	<2.30	<0.69	19.5	0.067	0.011
	Salicornia d	2.20	25.4	17.7	19.20	5.40	<0.73	37.5	0.10	0.059
8	Soil	5.29	224.0	35.9	72.2	20.9	<0.14	88.5	0.14	0.074
	Plants									
	Salicornia a	<0.003	0.4	9.7	<1.7	0.23	<1.10	27.3	0.13	0.024
	Salicornia b	<0.99	0.5	8.8	1.47	0.49	<0.77	57.4	0.10	0.018
	Salicornia c	<0.85	0.4	8.7	1.48	0.92	<0.66	36.0	0.21	0.030
	Salicornia d	<0.83	0.4	8.9	<0.93	0.38	<0.65	36.3	0.15	0.025
	Animals									
	Cerithidea? 1	*11.62*	*2.2*	*93.6*	*10.2*	*1.15*	*1.33*	*401.0*	*1.03*	*0.180*
	Cerithidea? 1	9.22	2.1	74.3	8.5	1.43	1.04	309.0	1.03	0.172
	Cerithidea? 2	2.5	1.2	23.5	4.5	0.82	1.47	131.4	0.34	0.055
9	Soil	19.3	183.0	68.5	107.7	85.6	0.41	142.2	0.28	0.383
	Soil (dup)	20.7	168.0	72.4	106.6	84.6	0.39	145.5	0.28	0.394
	Plants									
	Scirpus a	<0.71	6.4	6.83	4.26	<2.0	<0.60	41.7	0.20	0.020
	Scirpus b	<0.82	3.9	6.64	7.92	2.50	<0.62	43.5	0.37	0.026
	Scirpus c	<4.2	<4.2	10.13	2.03	2.50	<0.65	39.7	0.35	0.012
	Scirpus d	<0.79	3.9	5.52	1.97	<2.00	<0.58	27.2	0.19	0.024
10	Soil	17.2	126.0	67.9	93.3	47.8	0.91	135.0	0.56	0.321
	Plants									
	Typha a	<0.79	<3.4	4.06	2.28	<2.0	<0.63	19.0	0.035	0.016
	Typha b	<0.77	<3.6	4.95	2.16	<1.9	<0.63	17.8	0.067	0.026
	Typha c	<0.79	<3.5	5.36	2.64	2.19	<0.63	18.6	0.055	0.022
	Typha d	<0.87	<4.1	10.18	2.54	<2.1	<0.69	21.3	0.100	0.012

Table II-3. Concluded. Heavy Metal Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in mg/kg dry-weight)

Site		As	Cr	Cu	Ni	Pb	Se	Zn	Cd	Hg
11	Soil	15.3	181.0	50.3	83.3	13.7	0.16	89.8	0.22	0.283
	Plants									
	Scirpus a	0.87	2.7	31.1	6.70	0.87	<0.62	89.9	0.17	0.050
	Scirpus b	<0.89	4.0	17.4	9.39	1.03	<0.65	133.0	0.24	0.044
	Scirpus c	<0.79	0.7	15.3	4.47	0.49	<0.56	88.7	0.16	0.018
	Scirpus d	<0.84	1.9	13.6	5.81	0.76	<0.61	59.3	0.13	0.028
13	Soil	5.36	110.0	24.2	32.2	14.0	<0.14	161.7	0.55	0.059
	Plants									
	Typha a	<0.91	<7.1	9.41	7.40	4.0	<0.66	61.0	0.13	0.014
	Typha b	*<0.9*	*8.0*	*7.59*	*9.40*	*2.3*	*<0.63*	93.6	0.14	0.015
	Typha c	<0.87	<4.2	5.12	4.27	2.8	<0.62	34.3	0.07	0.016
	Typha d	<0.83	<4.0	4.0	8.31	<2.1	<0.62	98.8	0.09	0.010
	Animals									
	Corbicula	10.79	4.3	164.1	5.78	1.89	3.98	273.0	3.34	0.469
14	Soil	16.9	193.0	77.3	122.1	32.5	0.25	164.7	0.36	0.362
	Plants									
	Scirpus a	<0.79	3.3	7.7	3.47	1.18	<0.58	48.4	0.08	0.038
	Salicornia c	<0.92	3.6	10.1	3.78	0.99	<0.70	30.8	0.17	0.034
	Salicornia d	<0.95	1.7	11.4	1.85	0.71	<0.71	29.8	0.07	0.019

Table II-4. PCB Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
1	Soil	<30	<30	<30	<30	<30	150	<30
	Plants							
	Spartina a	<100	<100	<100	<100	<100	<100	<100
	Spartina b	<100	<100	<100	<100	<100	<100	<100
	Salicornia c	<100	<100	<100	<100	<100	<100	<100
	Salicornia d	<100	<100	<100	<100	<100	<100	<100
	Animals							
	Modiolus R1	<100	<100	<100	<100	<100	<100	<100
	Modiolus R2	<100	<100	<100	<100	<100	<100	<100
2	Soil	<30	<30	<30	<30	<30	83	<30
	Plants							
	Spartina a	<100	<100	<100	<100	<100	<100	<100
	Spartina b	<100	<100	<100	<100	<100	<100	<100
	Salicornia c	<20	<20	<20	<20	<20	<20	<20
	Salicornia d	<100	<100	<100	<100	<100	<100	<100
3	Soil	<30	<30	<30	<30	<30	210	<30
	Plants							
	Spartina a	<20	<20	<20	<20	<20	<20	<20
	Spartina b	<20	<20	<20	<20	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<20	<20
4	Soil	<30	<30	<30	<30	<30	120	<30
	Plants							
	Spartina a	<20	<20	<20	<20	<20	<20	<20
	Spartina b	<100	<100	<100	<100	<100	<100	<100
	Salicornia c	<20	<20	<20	<20	<20	<20	<20
	Salicornia d	<100	<100	<100	<100	<100	<100	<100
5	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Spartina a	<20	<20	<20	<20	<20	<20	<20
	Spartina b	<100	<100	<100	<100	<100	<100	<100
	Salicornia c	<100	<100	<100	<100	<100	<100	<100
	Salicornia d	<20	<20	<20	<20	<00	<100	<100

Table II-4 Continued. PCB Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
7	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Spartina a	<100	<100	<100	<100	<100	<100	<100
	Spartina b	<100	<100	<100	<100	<100	<100	<100
	Salicornia c	<100	<100	<100	<100	<100	<100	<100
	Salicornia d	<100	<100	<100	<100	<100	<100	<100
8	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Salicornia a	<20	<20	<20	<20	<20	<20	<20
	Salicornia b	<20	<20	<20	<20	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<20	<20
	Animals							
	Cerithidea? 1	<100	<100	<100	<100	<100	<100	<100
	Cerithidea? 2	<100	<100	<100	<100	<100	<100	<100
9	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Scirpus a	<100	<100	<100	<100	<100	<100	<100
	Scirpus b	<100	<100	<100	<100	<100	<100	<100
	Scirpus c	<100	<100	<100	<100	<100	<100	<100
	Scirpus d	<100	<100	<100	<100	<100	<100	<100
10	Soil	<50	<50	<50	<50	<50	<50	<50
	Plants							
	Typha a	<100	<100	<100	<100	<100	<100	<100
	Typha b	<100	<100	<100	<100	<100	<100	<100
	Typha c	<100	<100	<100	<100	<100	<100	<100
	Typha d	<100	<100	<100	<100	<100	<100	<100
11	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Scirpus a	<20	<20	<20	<20	<20	<20	<20
	Scirpus b	<20	<20	<20	<20	<20	<20	<20
	Scirpus c	<20	<20	<20	<20	<20	<20	<20
	Scirpus d	<20	<20	<20	<20	<20	<20	<20

Table II-4 Concluded. PCB Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
13	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Typha a	<100	<100	<100	<100	<100	<100	<100
	Typha b	<100	<100	<100	<100	<100	<100	<100
	Typha c	<100	<100	<100	<100	<100	<100	<100
	Typha d	<100	<100	<100	<100	<100	<100	<100
	Animals							
	Corbicula	<100	<100	<100	<100	<100	<100	<100
14	Soil	<30	<30	<30	<30	<30	<30	<30
	Plants							
	Scirpus a	<20	<20	<20	<20	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<20	<20

Table II-5. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Acenaph-thene	Acenaph-thylene	Anthr-acene	Benzo[a] Anthracene	Benzo[b] Fluoranthene	Benzo[k] Fluoranthene	Benzo[a] Pyrene
1	Soil	12	15	38	100	96	82	130
	Plants							
	Spartina a	<10	<10	<10	<10	<10	<10	<10
	Spartina b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10
	Animals							
	Modiolus R1	<10	<10	<10	<10	<10	<10	<10
	Modiolus R2	<10	<10	<10	<10	<10	<10	<10
2	Soil	<10	<10	15	41	58	44	63
	Plants							
	Spartina a	<10	<10	26	<10	<10	<10	<10
	Spartina b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10
3	Soil	<10	<10	<10	22	40	26	39
	Plants							
	Spartina a	<10	<10	<10	<10	<10	<10	<10
	Spartina b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10
4	Soil	<10	<10	15	47	67	50	80
	Plants							
	Spartina a	<10	<10	<10	<10	<10	<10	<10
	Spartina b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Acenaph-thene	Acenaph-thylene	Anthr-acene	Benzo[a] Anthracene	Benzo[b] Fluoranthene	Benzo[k] Fluoranthene	Benzo[a] Pyrene
5	Soil	<10	<10	<10	<10	<10	<10	<10
	Plants							
	Spartina a	<10	<10	<10	<10	<10	<10	<10
	Spartina b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10
7	Soil	<10	<10	16	67	82	72	86
	Plants							
	Spartina a	<10	<10	<10	<10	<10	<10	<10
	Spartina b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10
8	Soil	<10	<10	<10	<10	15	11	11
	Plants							
	Salicornia a	<10	<10	<10	<10	<10	<10	<10
	Salicornia b	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10
	Animals							
	Cerithidea? 1	<10	<10	<10	<10	<10	<10	<10
	Cerithidea? 2	<10	<10	<10	<10	<10	<10	<10
9	Soil	<10	<10	17	56	83	67	62
	Plants							
	Scirpus a	<10	<10	<10	<10	<10	<10	<10
	Scirpus b	<10	<10	<10	<10	<10	<10	<10
	Scirpus c	<10	<10	<10	<10	<10	<10	<10
	Scirpus d	<10	<10	<10	<10	<10	<10	<10
10	Soil	19	120	97	150	211	150	130
	Plants							
	Typha a	<10	<10	<10	<10	<10	<10	<10
	Typha b	<10	<10	<10	<10	<10	<10	<10
	Typha c	<10	<10	<10	<10	<10	<10	<10
	Typha d	<10	<10	<10	<10	<10	<10	<10

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Acenaph-thene	Acenaph-thylene	Anthr-acene	Benzo[a] Anthracene	Benzo[b] Fluoranthene	Benzo[k] Fluoranthene	Benzo[a] Pyrene
11	Soil	<10	<10	<10	<10	<10	<10	<10
	Plants							
	Scirpus a	<10	<10	<10	<10	<10	<10	<10
	Scirpus b	<10	<10	<10	<10	<10	<10	<10
	Scirpus c	<10	<10	<10	<10	<10	<10	<10
	Scirpus d	<10	<10	<10	<10	<10	<10	<10
13	Soil	<10	<10	<10	29	18	20	22
	Plants							
	Typha a	<10	<10	<10	<10	<10	<10	<10
	Typha b	<10	<10	<10	<10	<10	<10	<10
	Typha c	<10	<10	<10	<10	<10	<10	<10
	Typha d	<10	<10	<10	<10	<10	<10	<10
	Animals							
	Corbicula	<10	<10	<10	<10	<10	<10	<10
14	Soil	<10	<10	<10	11	18	13	16
	Plants							
	Scirpus a	<10	<10	<10	<10	<10	<10	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	<10

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Benzo [g,h,i] perylene	Chrysene	Dibenzo [a,h] anthracene	Fluor-anthene	Fluorene	Ideno-1,2,3-pyrene	2-Methyl-Naph-thalene	Naph-thalene
1	Soil	110	100	19	190	<10	99	30	61
	Plants								
	Spartina a	<10	<10	<10	<10	15	<10	29	63
	Spartina b	<10	<10	<10	<10	<10	<10	<20	42
	Salicornia c	<10	<10	<10	<10	<10	<10	20	50
	Salicornia d	<10	<10	<10	<10	<10	<10	<20	<50
	Animals								
	Modiolus R1	<10	<10	<10	<10	<10	<10	45	120
	Modiolus R2	<10	<10	<10	<10	<10	<10	<30	61
2	Soil	68	51	10	94	<10	59	27	53
	Plants								
	Spartina a	<10	<10	<10	<10	<10	<10	21	<50
	Spartina b	<10	<10	<10	<10	<10	<10	32	<50
	Salicornia c	<10	<10	<10	<10	<10	<10	24	61
	Salicornia d	<10	<10	<10	<10	<10	<10	37	98
3	Soil	53	27	<10	54	<10	43	35	64
	Plants								
	Spartina a	<10	<10	<10	<10	<10	<10	24	68
	Spartina b	<10	<10	<10	<10	<10	<10	29	88
	Salicornia c	<10	<10	<10	<10	<10	<10	<20	<50
	Salicornia d	<10	<10	<10	<10	<10	<10	28	83
4	Soil	88	53	11	110	<10	77	25	50
	Plants								
	Spartina a	<10	<10	<10	<10	<10	<10	<20	<50
	Spartina b	<10	<10	<10	<10	<10	<10	30	63
	Salicornia c	<10	<10	<10	<10	<10	<10	25	73
	Salicornia d	<10	<10	<10	<10	<10	<10	<20	41
5	Soil	<10	<10	<10	<10	<10	<10	15	34
	Plants								
	Spartina a	<10	<10	<10	<10	<10	<10	25	68
	Spartina b	<10	<10	<10	<10	<10	<10	<20	<50
	Salicornia c	<10	<10	<10	<10	<10	<10	<20	30
	Salicornia d	<10	<10	<10	<10	<10	<10	24	59

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Benzo [g,h,i] perylene	Chrysene	Dibenzo [a,h] anthracene	Fluor-anthene	Fluorene	Ideno-1,2,3-pyrene	2-Methyl-Naph-thalene	Naph-thalene
7	Soil	100	71	15	120	<10	87	12	26
	Plants								
	Spartina a	<10	<10	<10	<10	<10	<10	28	54
	Spartina b	<10	<10	<10	<10	<10	<10	<20	28
	Salicornia c	<10	<10	<10	<10	<10	<10	<20	30
	Salicornia d	<10	<10	<10	11	<10	<10	<20	30
8	Soil	15	15	<10	18	<10	11	<10	56
	Plants								
	Salicornia a	<10	<10	<10	<10	<10	<10	30	16
	Salicornia b	<10	<10	<10	<10	<10	<10	28	89
	Salicornia c	<10	<10	<10	<10	<10	<10	25	68
	Salicornia d	<10	<10	<10	<10	<10	<10	28	89
	Animals								
	Cerithidea? 1	<10	<10	<10	<10	<10	<10	<30	<60
	Cerithidea? 2	<10	11	<10	<10	<10	<10	<30	<60
9	Soil	<10	<10	17	56	83	67	NA	62
	Plants								
	Scirpus a	<10	<10	<10	<10	<10	<10	NA	<10
	Scirpus b	<10	<10	<10	<10	<10	<10	NA	<10
	Scirpus c	<10	<10	<10	<10	<10	<10	NA	<10
	Scirpus d	<10	<10	<10	<10	<10	<10	NA	<10
10	Soil	19	120	97	150	211	150	NA	130
	Plants								
	Typha a	<10	<10	<10	<10	<10	<10	NA	<10
	Typha b	<10	<10	<10	<10	<10	<10	NA	<10
	Typha c	<10	<10	<10	<10	<10	<10	NA	<10
	Typha d	<10	<10	<10	<10	<10	<10	NA	<10
11	Soil	<10	<10	<10	<10	<10	<10	NA	<10
	Plants								
	Scirpus a	<10	<10	<10	<10	<10	<10	NA	<10
	Scirpus b	<10	<10	<10	<10	<10	<10	NA	<10
	Scirpus c	<10	<10	<10	<10	<10	<10	NA	<10
	Scirpus d	<10	<10	<10	<10	<10	<10	NA	<10

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Benzo [g,h,i] Perylene	Chrysene	Dibenzo [a,h] anthracene	Fluor-anthene	Fluorene	Ideno-1,2,3-Pyrene	2-Methyl-Naph-thalene	Naph-thalene
13	Soil	<10	<10	<10	29	18	20	NA	22
	Plants								
	Typha a	<10	<10	<10	<10	<10	<10	NA	<10
	Typha b	<10	<10	<10	<10	<10	<10	NA	<10
	Typha c	<10	<10	<10	<10	<10	<10	NA	<10
	Typha d	<10	<10	<10	<10	<10	<10	NA	<10
	Animals								
	Corbicula	<10	<10	<10	<10	<10	<10	NA	<10
14	Soil	<10	<10	<10	11	18	13	NA	16
	Plants								
	Scirpus a	<10	<10	<10	<10	<10	<10	NA	<10
	Salicornia c	<10	<10	<10	<10	<10	<10	NA	<10
	Salicornia d	<10	<10	<10	<10	<10	<10	NA	<10

NA - not available

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Phenanthrene	Pyrene
1	Soil	94	240
	Plants		
	Spartina a	31	<10
	Spartina b	13	<10
	Salicornia c	10	<10
	Salicornia d	28	<10
	Animals		
	Modiolus R1	37	26
	Modiolus R2	14	<10
2	Soil	36	120
	Plants		
	Spartina a	30	<10
	Spartina b	20	<10
	Salicornia c	22	<10
	Salicornia d	<10	<10
3	Soil	25	72
	Plants		
	Spartina a	14	<10
	Spartina b	14	<10
	Salicornia c	<10	<10
	Salicornia d	13	<10
4	Soil	42	140
	Plants		
	Spartina a	<10	<10
	Spartina b	38	<10
	Salicornia c	13	<10
	Salicornia d	<10	<10
5	Soil	<10	<10
	Plants		
	Spartina a	17	<10
	Spartina b	<10	<10
	Salicornia c	<10	<10
	Salicornia d	<10	<10

Table II-5 Continued. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Phenanthrene	Pyrene
7	Soil	45	160
	Plants		
	Spartina a	37	<10
	Spartina b	12	12
	Salicornia c	<10	<10
	Salicornia d	<10	12
8	Soil	<10	20
	Plants		
	Salicornia a	16	<10
	Salicornia b	12	<10
	Salicornia c	20	<10
	Salicornia d	15	<10
	Animals		
	Cerithidea? 1	<10	<10
	Cerithidea? 2	<10	10
9	Soil	20	89
	Plants		
	Scirpus a	17	19
	Scirpus b	18	11
	Scirpus c	18	19
	Scirpus d	11	<10
10	Soil	76	240
	Plants		
	Typha a	<10	<10
	Typha b	<10	<10
	Typha c	11	<10
	Typha d	20	<10
11	Soil	<10	<10
	Plants		
	Scirpus a	18	<10
	Scirpus b	18	<10
	Scirpus c	10	<10
	Scirpus d	14	<10

Table II-5 Concluded. PAH Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Phenanthrene	Pyrene
13	Soil	20	46
	Plants		
	Typha a	12	10
	Typha b	<10	<10
	Typha c	18	<10
	Typha d	<10	<10
	Animals		
	Corbicula	<10	<10
14	Soil	13	33
	Plants		
	Scirpus a	<10	<10
	Salicornia c	<10	<10
	Salicornia d	<10	<10

Table II-6 Pesticide Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Aldrin	a-BHC	b-BHC	d-BHC	g-BHC	Chlor-dane	4,4-DDD	4,4-DDE	4,4-DDT
1	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Spartina a	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Animals									
	Modiolus R1	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Modiolus R2	<10	<10	<10	<10	<10	<10	<10	<10	<10
2	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Spartina a	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20
3	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Spartina a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Spartina b	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia d	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Spartina a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20
5	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Spartina a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Table II-6 Pesticide Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Aldrin	a-BHC	b-BHC	d-BHC	g-BHC	Chlor-dane	4,4-DDD	4,4-DDE	4,4-DDT
7	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.6	<3.0
	Plants									
	Spartina a	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20
8	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Salicornia a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2,0
	Salicornia b	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Animals									
	Cerithidea? 1	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Cerithidea? 2	<10	<10	<10	<10	<10	<10	<10	<10	<10
9	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Scirpus a	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Scirpus b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Scirpus c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Scirpus d	<20	<20	<20	<20	<20	<30	<20	<20	<20
10	Soil	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Plants									
	Typha a	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Typha b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Typha c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Typha d	<20	<20	<20	<20	<20	<30	<20	<20	<20
11	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Scirpus a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Scirpus b	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Scirpus c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Scirpus d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Table II-6 Pesticide Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Aldrin	a-BHC	b-BHC	d-BHC	g-BHC	Chlor-dane	4,4-DDD	4,4-DDE	4,4-DDT
13	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Typha a	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Typha b	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Typha c	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Typha d	<20	<20	<20	<20	<20	<30	<20	<20	<20
	Animals									
	Corbicula	<10	<10	<12	<24	<10	<10	<10	<115	<30
14	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants									
	Scirpus a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Table II-6 Continued. Pesticide Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Dieldrin	Endo-sulfan I	Endo- II	Endo- Sulfate	Endrin Aldehyde	Hepta-chlor	Hepta-chlor Epoxide	Meth-oxy-chlor	Toxa-phene	
1	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<200
	Plants										
	Spartina a	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Animals										
	Modiolus R1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<500
	Modiolus R2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<500
2	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<200
	Plants										
	Spartina a	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20	<200
3	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<200
	Plants										
	Spartina a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<200
	Spartina b	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<200
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<200
	Salicornia d	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<200
4	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<200
	Plants										
	Spartina a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<200
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20

Table II-6 Continued. Pesticide Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg wet-weight)

Site		Dieldrin	Endo-sulfan I	Endo-sulfan II	Endo-sulfan Sulfate	Endrin	Endrin Aldehyde	Hepta-chlor	Hepta-chlor Epoxide	Meth-oxy-chlor	Toxa-phene
5	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants										
	Spartina a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Salicornia d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
7	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.6	<3.0	<3.0
	Plants										
	Spartina a	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Spartina b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Salicornia c	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Salicornia d	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
8	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants										
	Salicornia a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia b	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Salicornia d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Animals										
	Cerithidea? 1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Cerithidea? 2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
9	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants										
	Scirpus a	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Scirpus b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Scirpus c	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Scirpus d	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20

Table II-6 Concluded. Pesticide Concentration in Naturally-occurring Wetland Plants and Soils (Concentration in ug/kg Wet Weight)

Site		Dieldrin	Endo-sulfan I I	Endo-sulfan II	Sulfate	Endrin	Endrin Aldehyde	Hepta-chlor	Hepta-chlor Epoxide	Met-oxy-chlor	Toxa-phene
10	Soil	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Plants										
	Typha a	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Typha b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Typha c	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Typha d	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
11	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants										
	Scirpus a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Scirpus b	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Scirpus c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Scirpus d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
13	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
	Plants										
	Typha a										
	Typha b	<20	<20	<20	<20	<20	<30	<20	<20	<20	<20
	Typha c										
	Typha d	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Animals										
	Corbicula	16	<10	<10	<10	18	<10	42	<10	<10	
14	Soil	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
	Plants										
	Scirpus a	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	Salicornia c	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	Salicornia d	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	

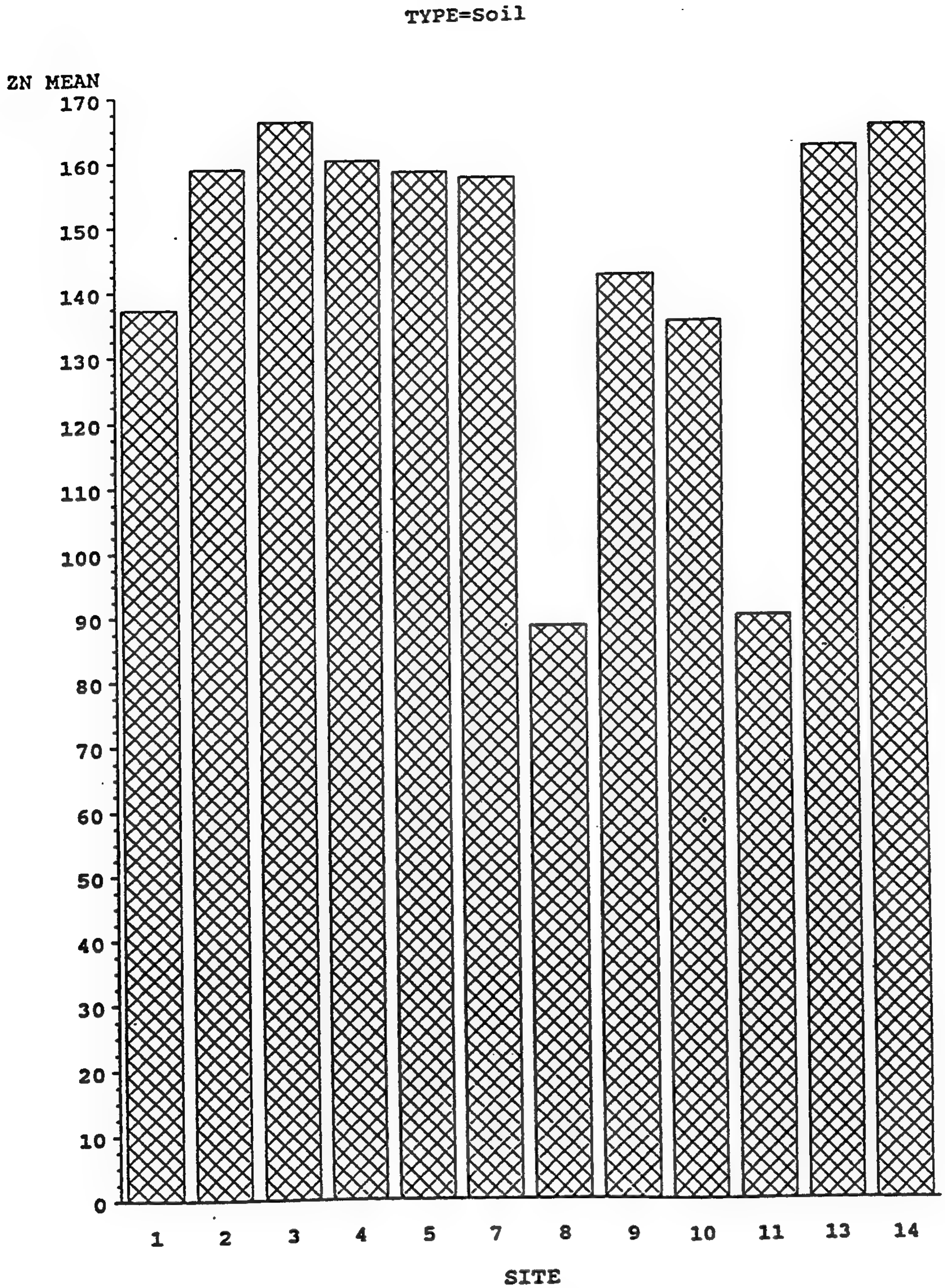

Figure II-17. Mean Zinc Concentrations in Soil from Sites 1 through 14.

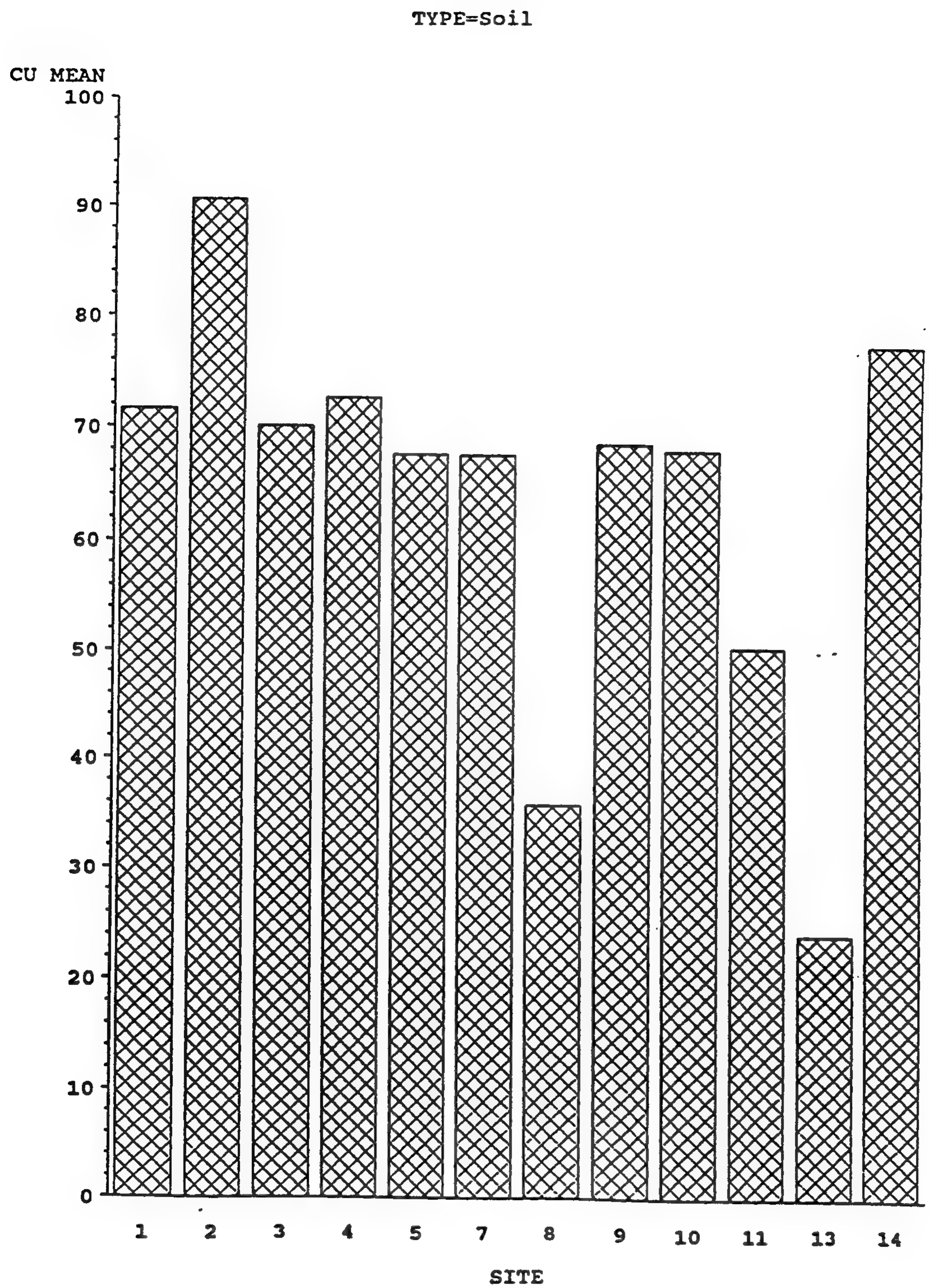

Figure II-18. Mean Copper Concentrations in Soil from Sites 1 through 14.

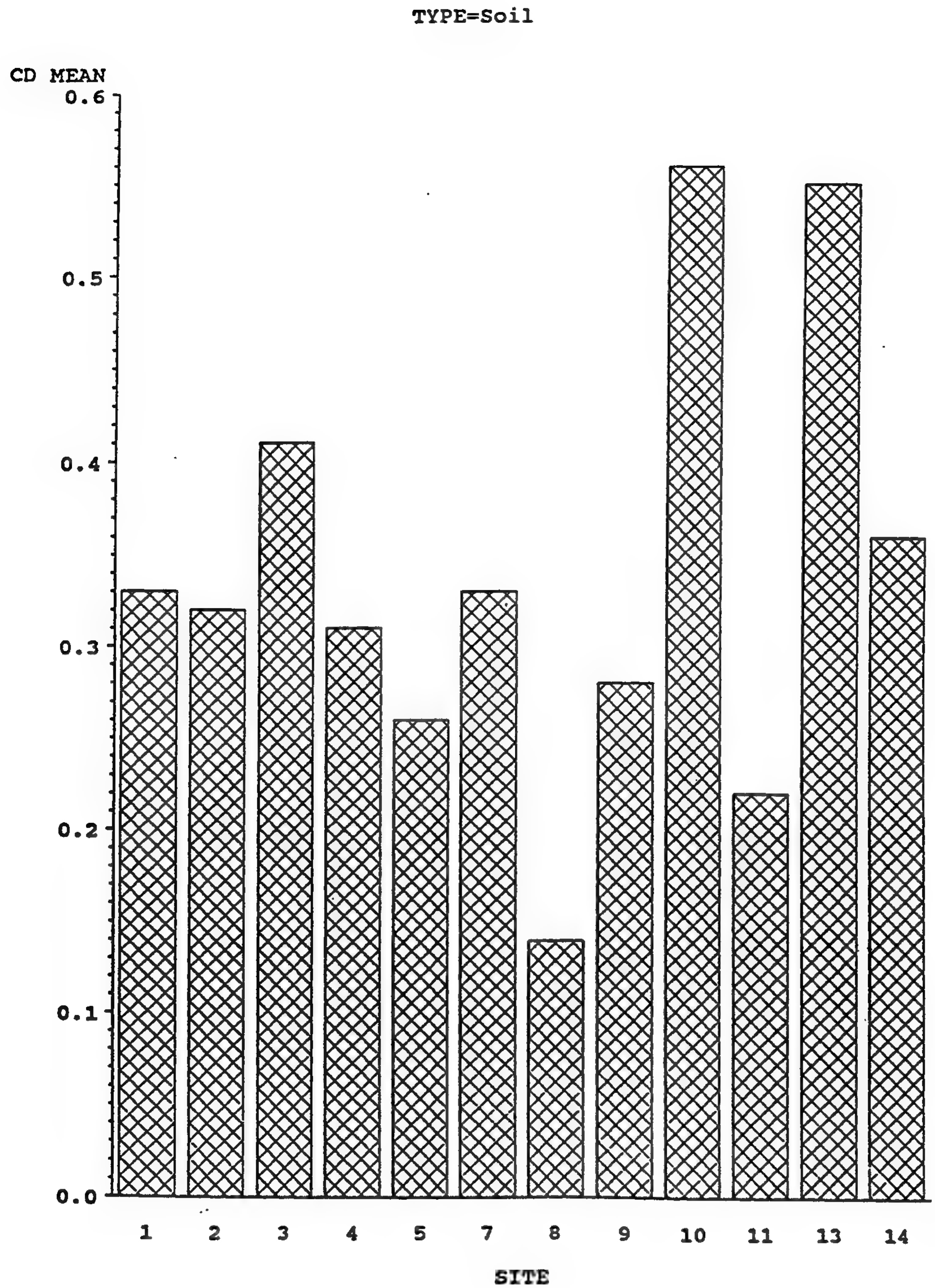

Figure II-19. Mean Cadmium Concentrations in Soil from Sites 1 through 14.

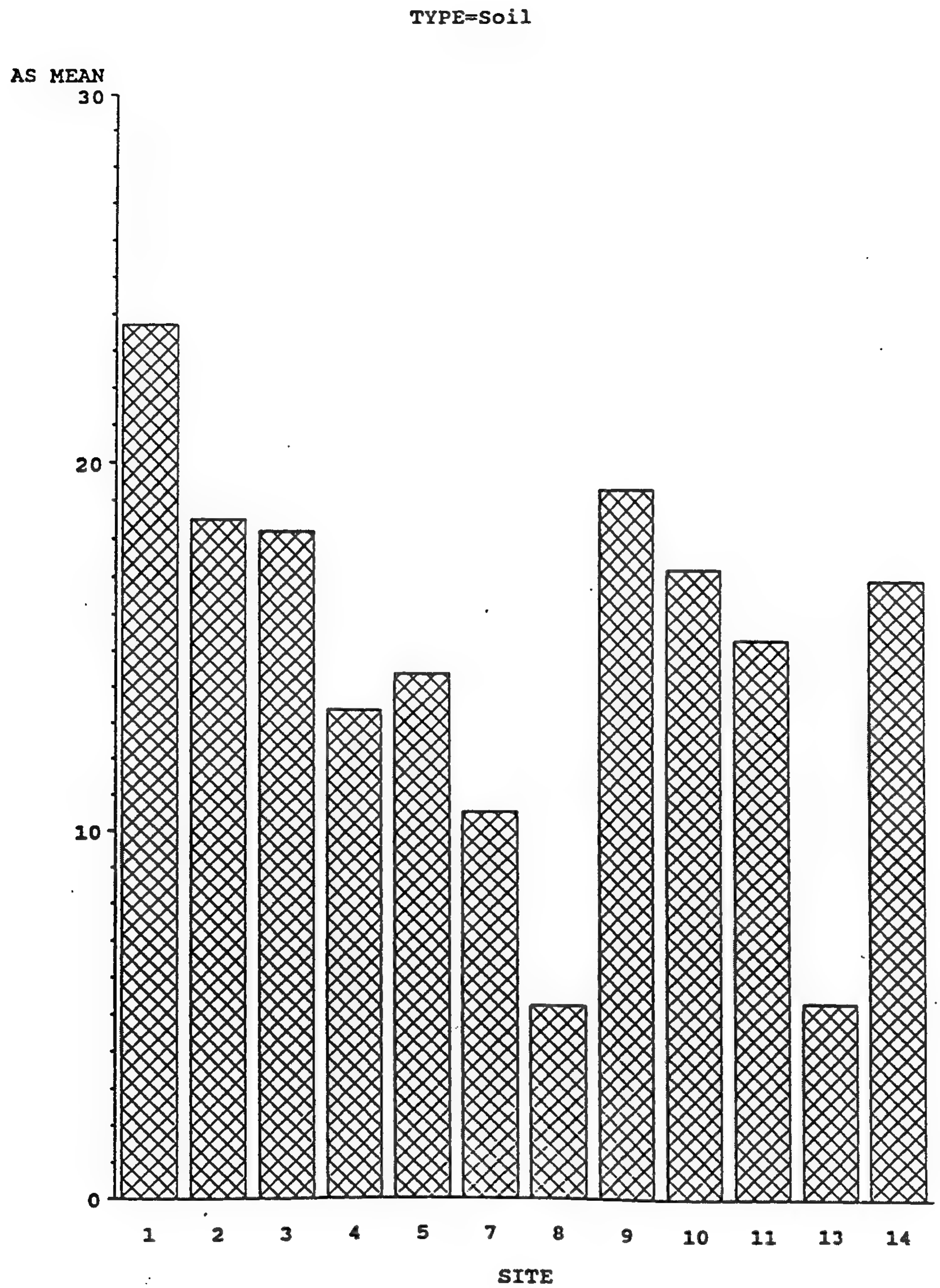

Figure II-20. Mean Arsenic Concentrations in Soil from Sites 1 through 14.

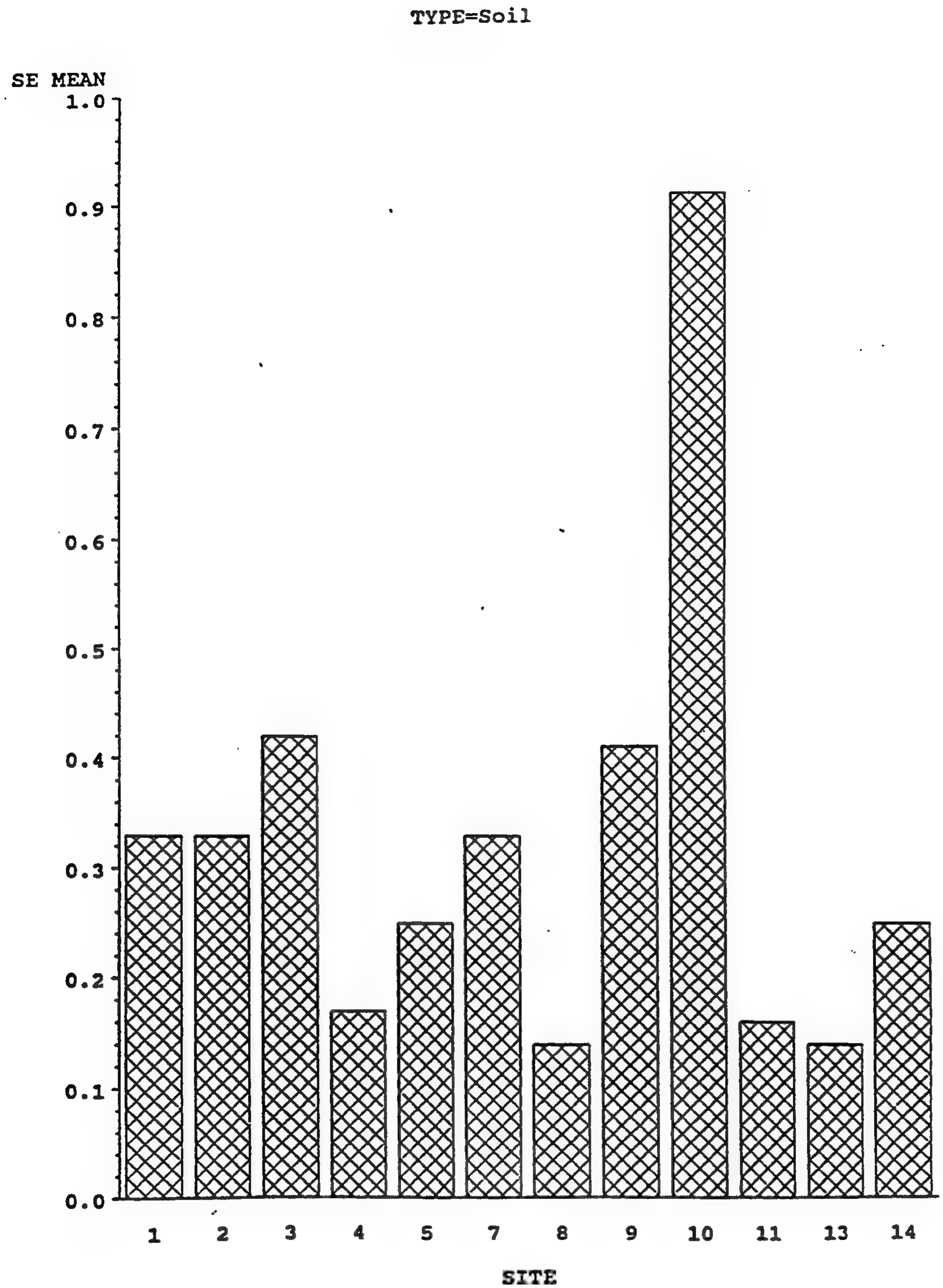

Figure II-21. Mean Selenium Concentrations in Soil from Sites 1 through 14.

Figure II-22. Mean Mercury Concentrations in Soil from Sites 1 through 14.

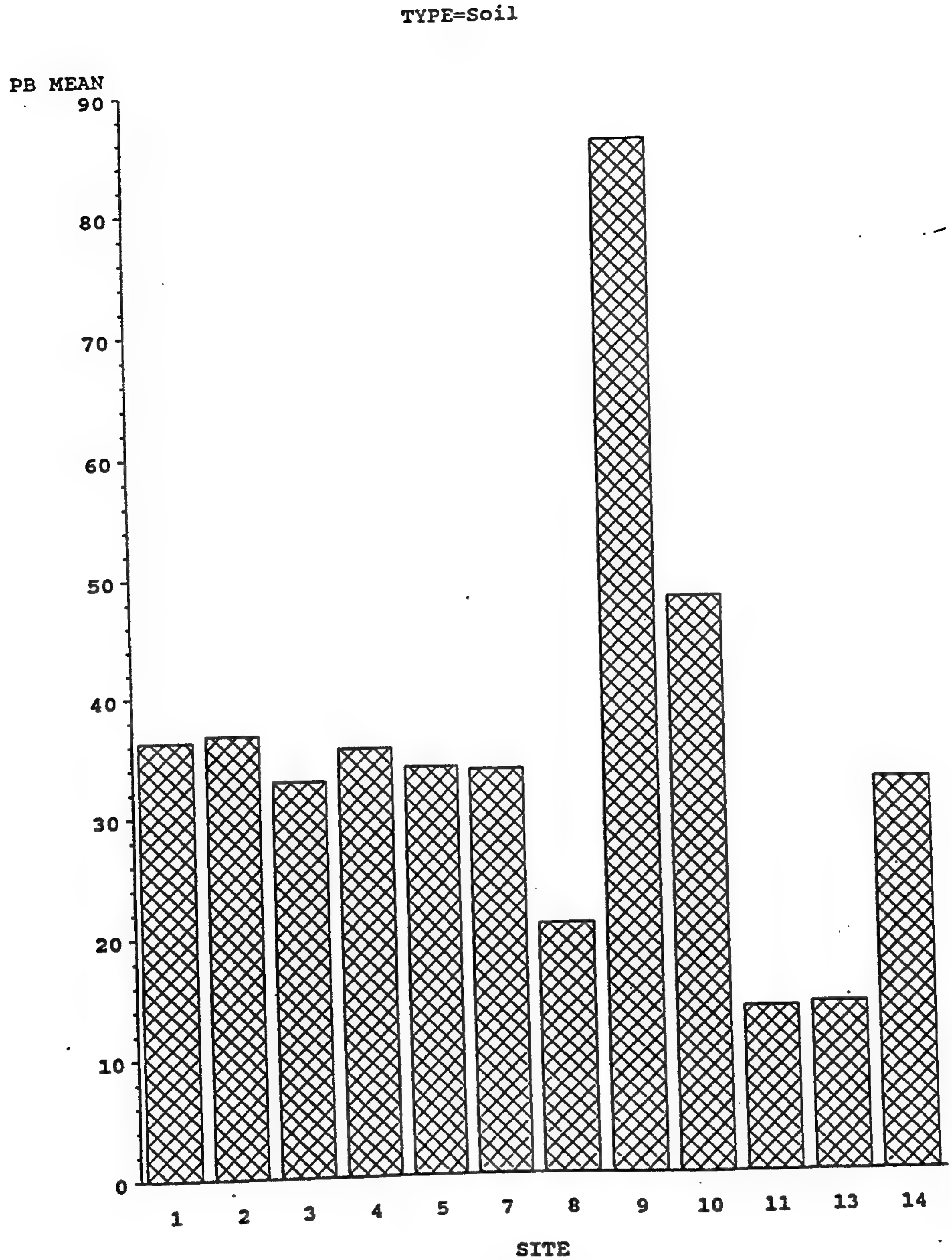

Figure II-23. Mean Lead Concentrations in Soil from Sites 1 through 14.

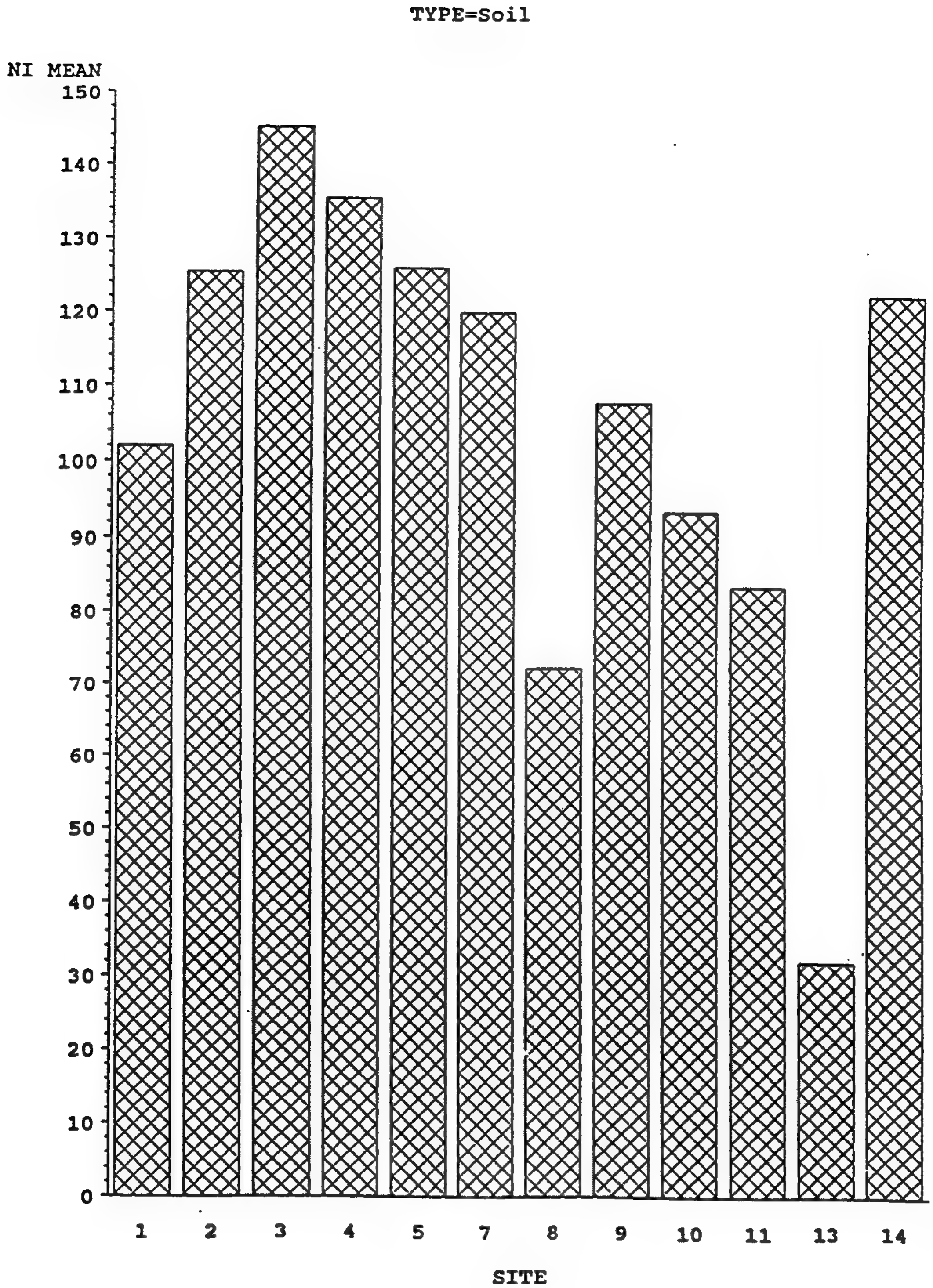

Figure II-24. Mean Nickel Concentrations in Soil from Sites 1 through 14.

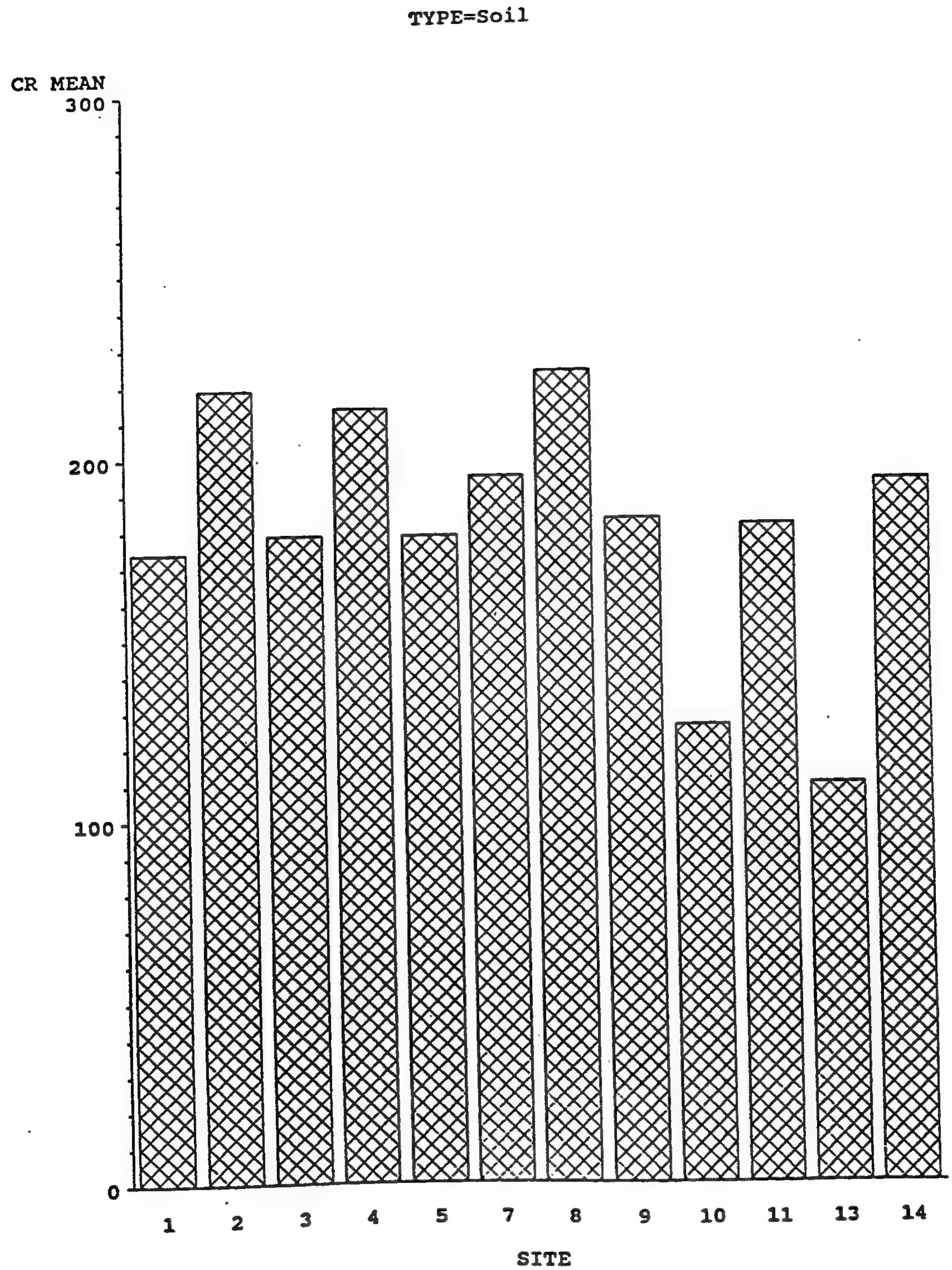

Figure II-25. Mean Chromium Concentrations in Soil from Sites 1 through 14.

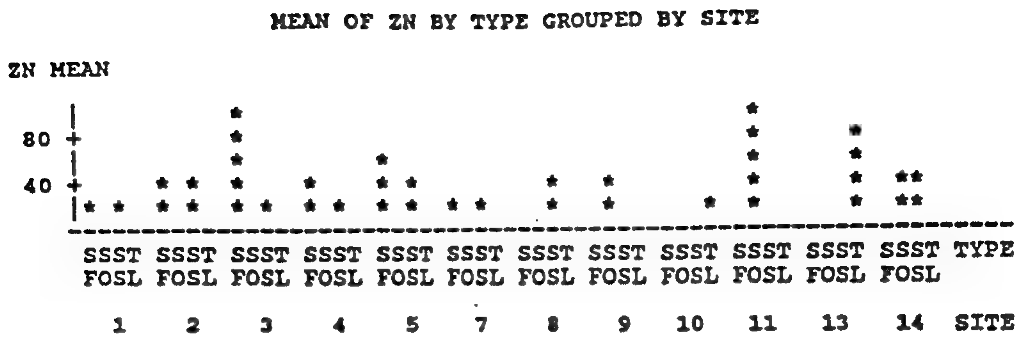

Figure II-26. Mean Zinc Concentrations of Plants, *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

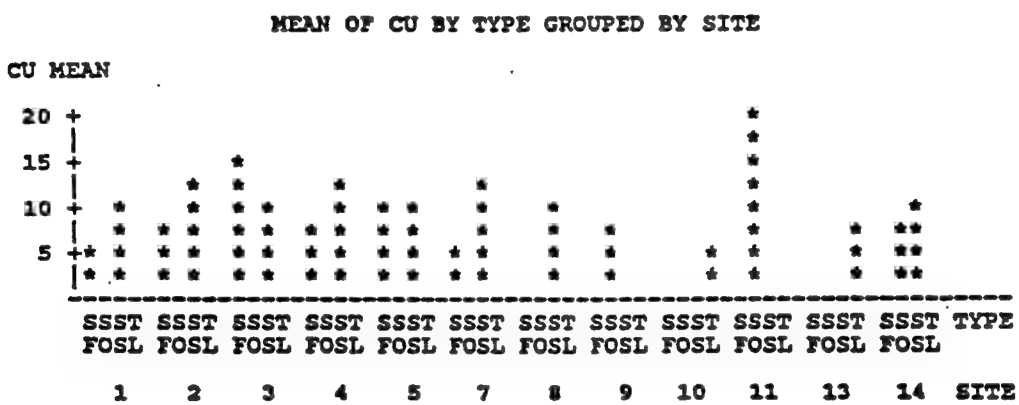

Figure II-27. Mean Copper Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

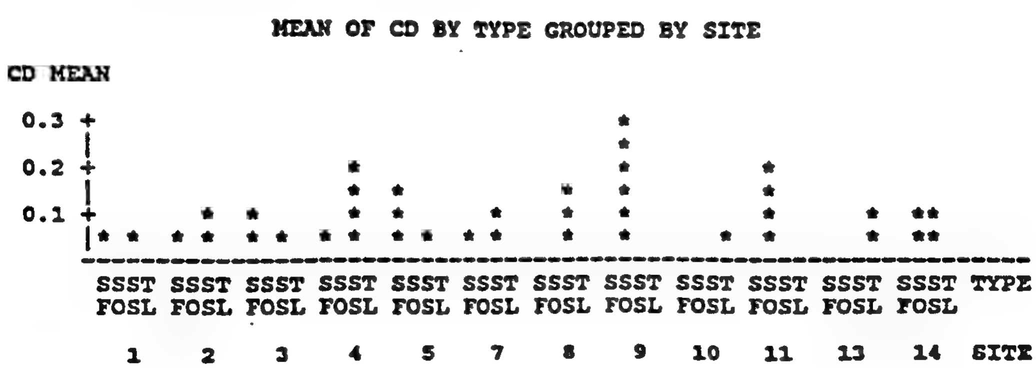

Figure II-28. Mean Cadmium Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

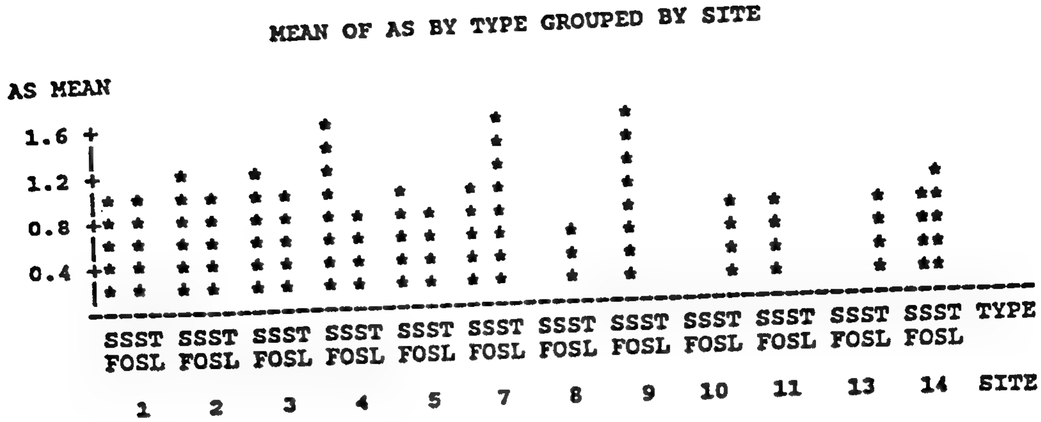

Figure II-29. Mean Arsenic Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

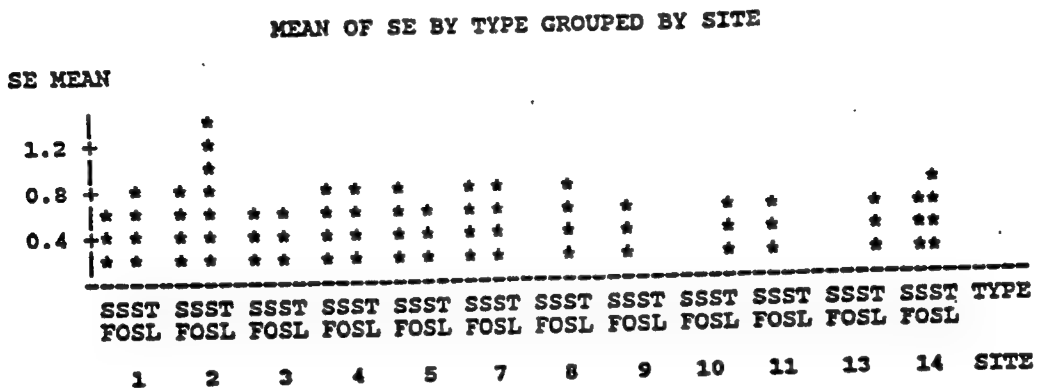

Figure II-30. Mean Selenium Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

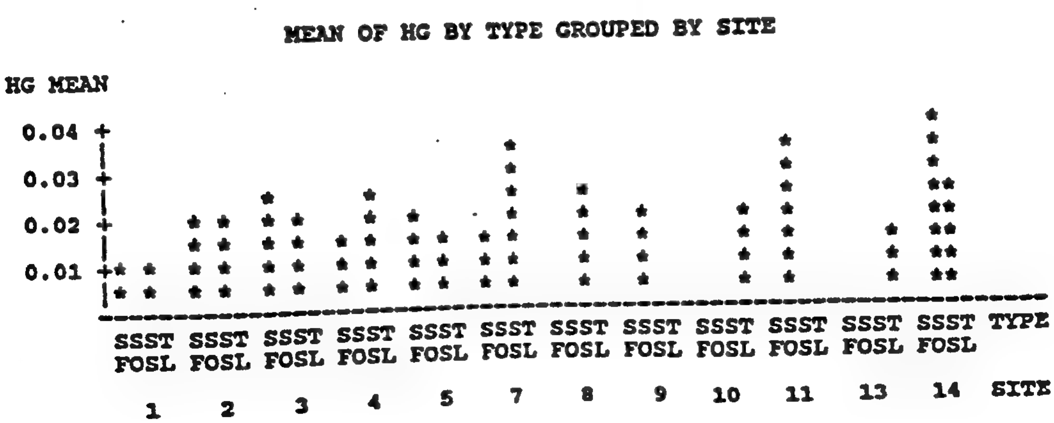

Figure II-31. Mean Mercury Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

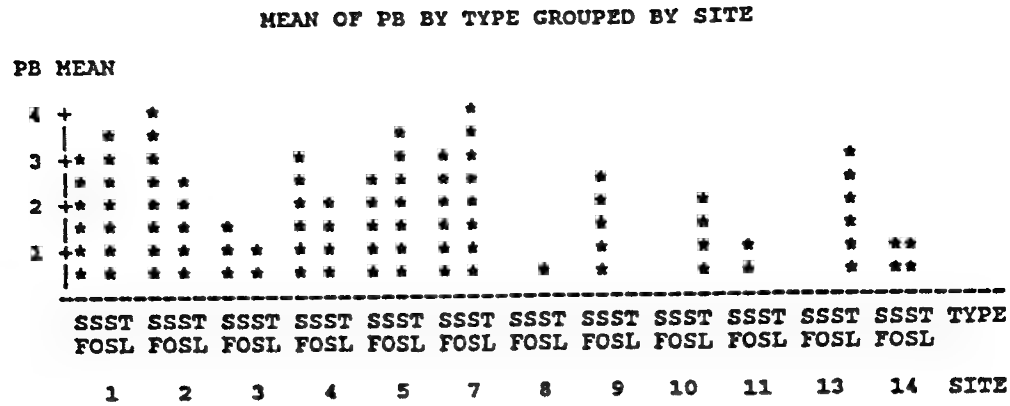

Figure II-32. Mean Lead Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

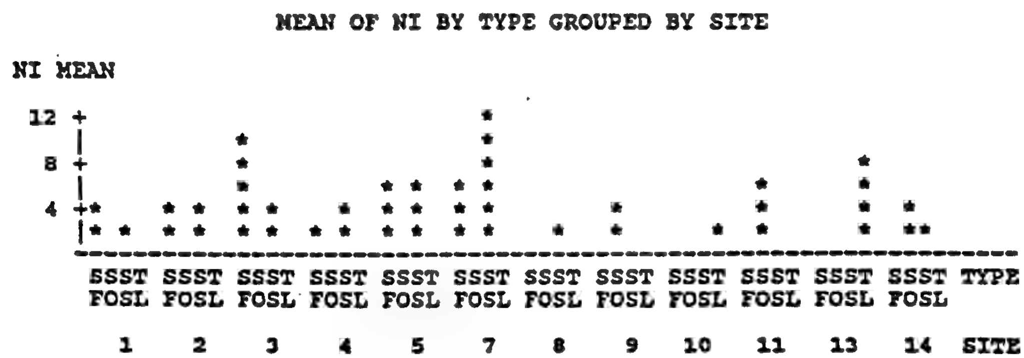

Figure II-33. Mean Nickel Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

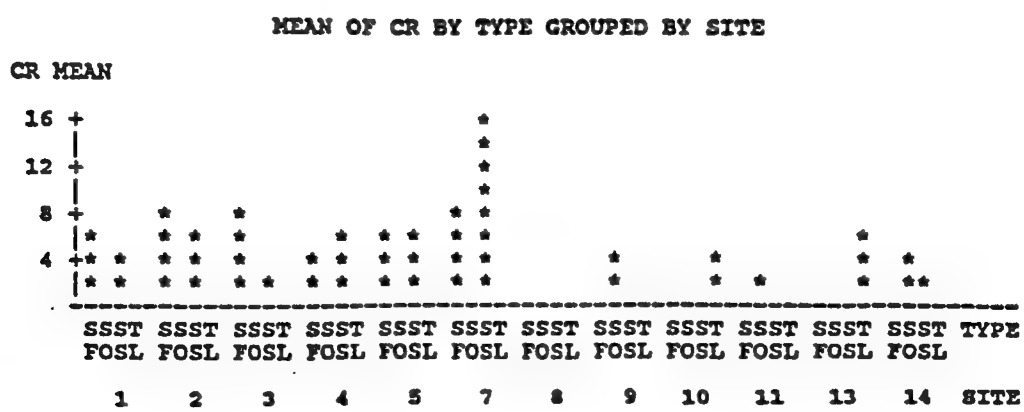

Figure II-34. Mean Chromium Concentrations of Plants *Spartina* (SF), *Salicornia* (SO), *Scirpus* (SS), and *Typha* (TL) Grouped by Site.

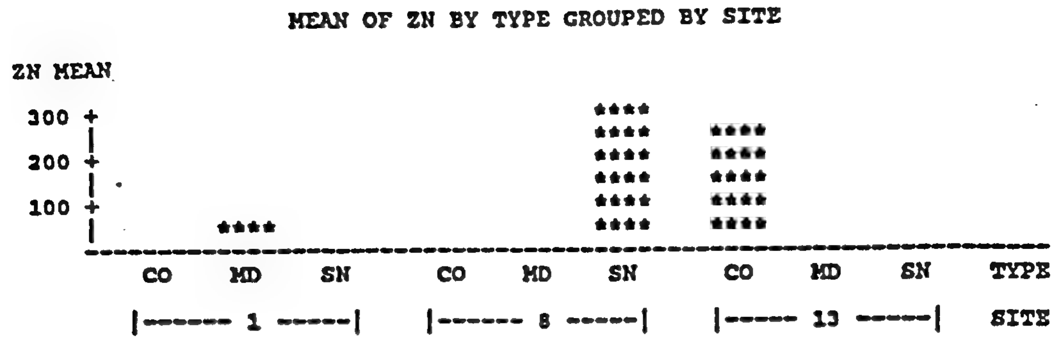

Figure II-35. Mean Zinc Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

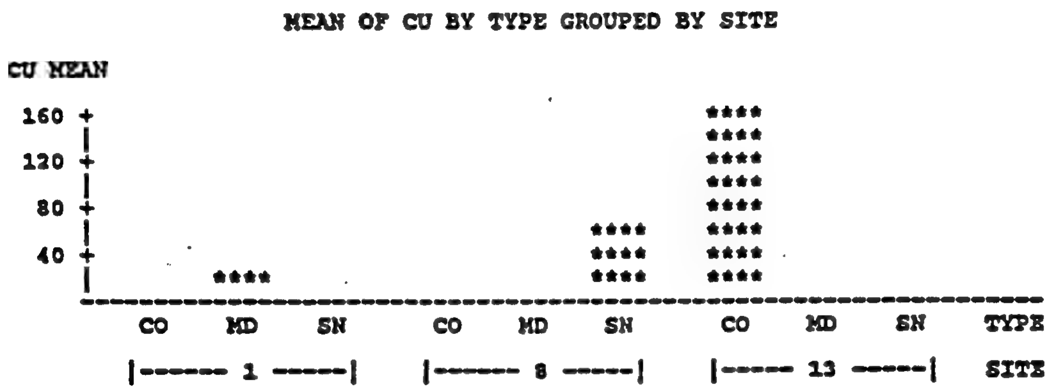

Figure II-36. Mean Copper Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

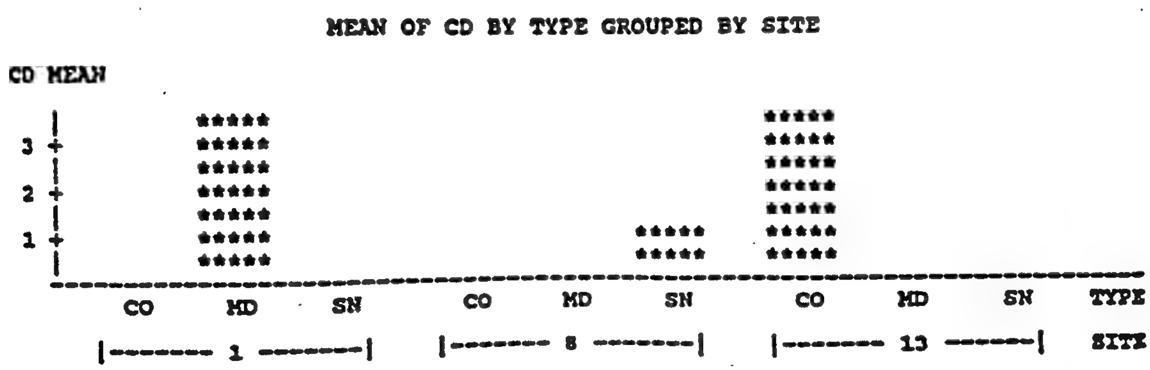

Figure II-37. Mean Chromium Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

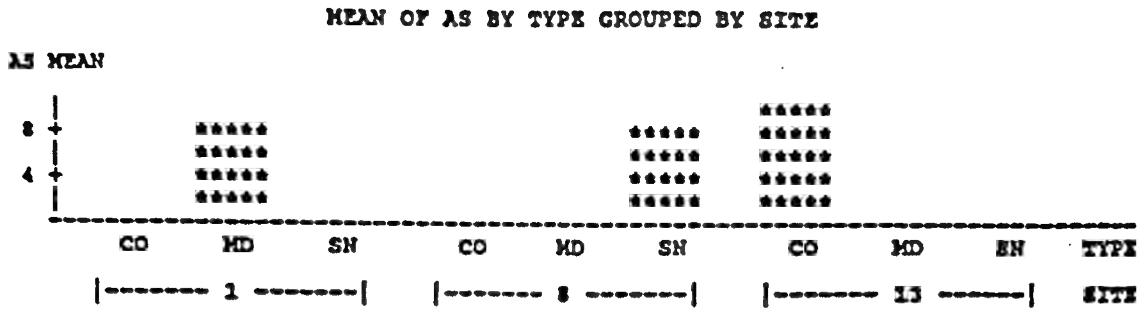

Figure II-38. Mean Arsenic Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

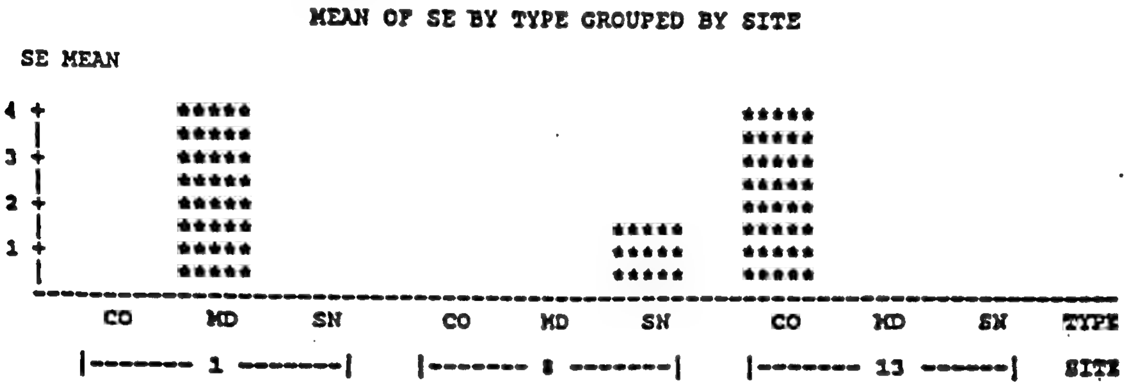

Figure II-39. Mean Selenium Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

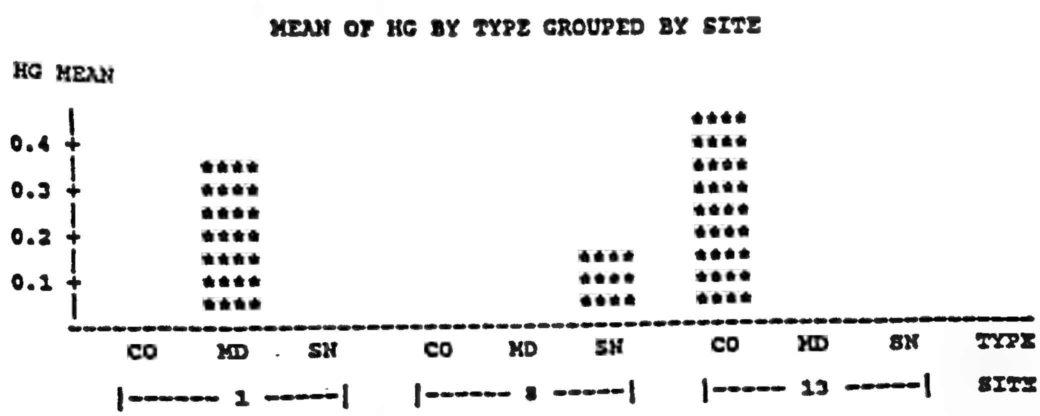

Figure II-40. Mean Mercury Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

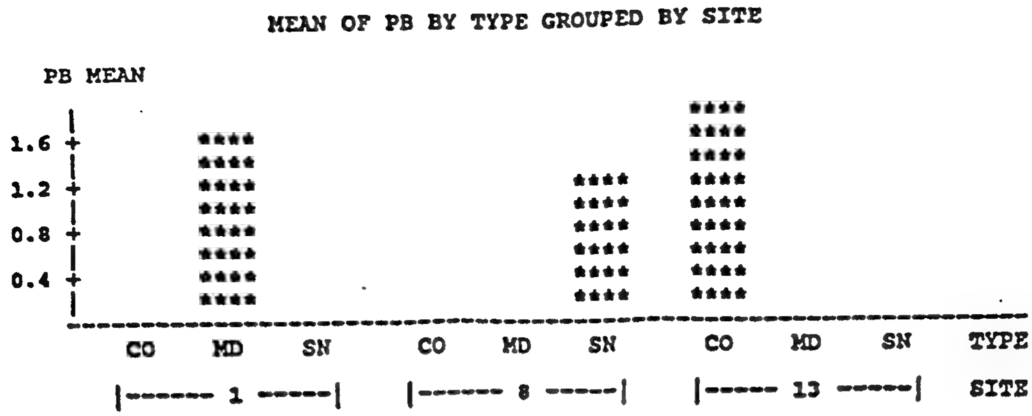

Figure II-41. Mean Lead Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

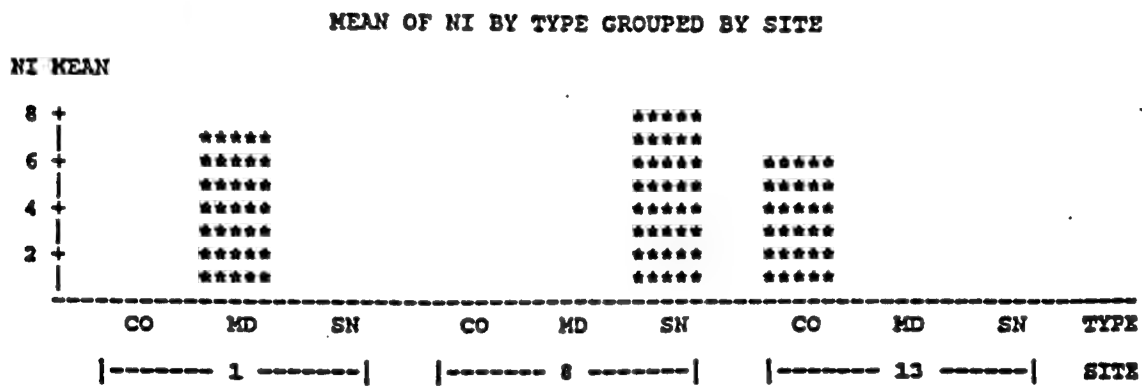

Figure II-42. Mean Nickel Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

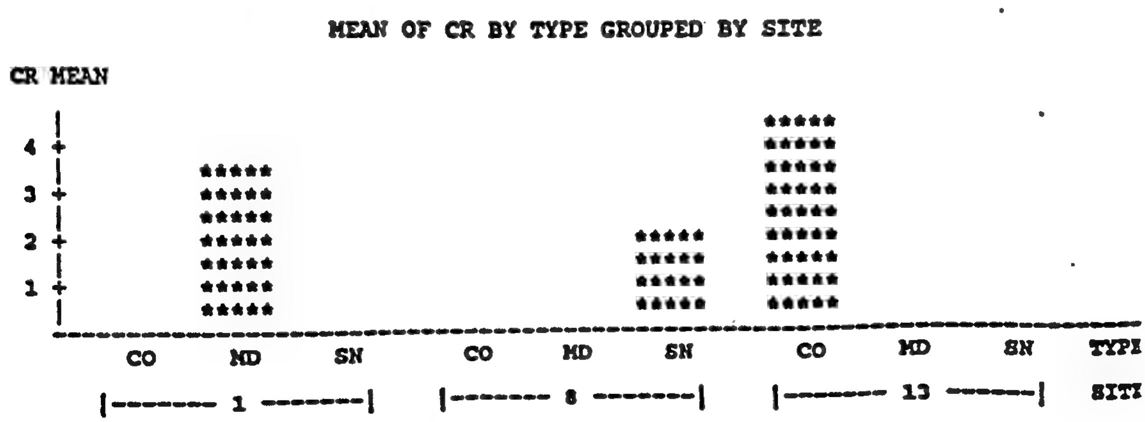

Figure II-43. Mean Chromium Concentrations of Organisms *Corbicula* (CO), *Modiolus* (MD), *Nassarius* (SN) Grouped by site.

Table II-7 Summary of Concentrations of Contaminants in Soils Under Field Conditions (Concentrations in mg/kg, dry-weight for metals, and ug/kg, wet-weight all others)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
Metals						
As	14.87	5.29 - 23.7	18.5	16.9 - 19.3	10.3	5.3 - 15.3
Cr	197.7	174.0 - 224.0	167.5	126.0 - 193.0	145.5	110.0 - 181.0
Cu	68.6	35.9 - 90.6	71.5	67.9 - 77.3	37.3	24.2 - 50.3
Ni	120.8	72.2 - 145.2	107.4	93.3 - 122.1	57.8	32.2 - 83.3
Pb	32.9	20.9 - 36.8	62.6	32.5 - 85.6	13.9	13.7 - 14.0
Se	0.28[*]	<0.14 - 0.42	0.49	0.25 - 0.91	0.15[*]	<0.14 - 0.16
Zn	146.67	88.5 - 166.1	146.9	135.0 - 164.7	125.8	89.8 - 161.7
Cd	0.30	0.33 - 0.41	0.37	0.28 - 0.56	0.39	0.22 - 0.55
Hg	0.364	0.074 - 0.515	0.365	0.321 - 0.394	0.171	0.059 - 0.283
Butyltins						
Tetrabutyltin	1.76[*]	<1.2 - 2.9	1.6[*]	<1.3 - <1.9	<0.9[$]	<0.9[@]
Tributyltin	2.57	2.0 - 3.1	3.4	3.2 - 3.6	17.6	1.8 - 33.4
Dibutyltin	3.01[*]	<1.4 - 89.6	4.3[*]	<1.6 - 9.6	<0.9[$]	<0.9[@]
Monobutyltin	3.83[*]	<1.3 - 17.0	3.1	2.1 - 4.7	<0.9[$]	<0.9[@]
PCBs						
Aroclor 1016	<30[$]	<30[@]	<36.7[$]	<30 - <50	<30[$]	<30[@]
Aroclor 1221	<30[$]	<30[@]	<36.7[$]	<30 - <50	<30[$]	<30[@]
Aroclor 1232	<30[$]	<30[@]	<36.7[$]	<30 - <50	<30[$]	<30[@]
Aroclor 1242	<30[$]	<30[@]	<36.7[$]	<30 - <50	<30[$]	<30[@]
Aroclor 1248	<30[$]	<30[@]	<36.7[$]	<30 - <50	<30[$]	<30[@]
Aroclor 1254	93.3[$]	<30 - 210	<36.7[$]	<30 - <50	<30[$]	<30[@]
Aroclor 1260	<30[$]	<30[@]	<36.7[$]	<30 - <50	<30[$]	<30[@]

[*] : This mean contains at least one less than value.
[@] : Every variable in this set was this same value.
[$] : All values were less than detection limits.

Table II-7 Continued. Summary of Concentrations of Contaminants in Soils Under Field Conditions (Concentrations in ug/kg, wet-weight basis)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
PAHs						
Acenaphthene	10.3[*]	<10 - 12	13.0[*]	<10 - 19	<10[$]	<10[@]
Acenaphthylene	10.7[*]	<10 - 15	46.7[*]	<10 - 120	<10[$]	<10[@]
Anthracene	16.3[*]	<10 - 38	41.3[*]	<10 - 97	<10[$]	<10[@]
Benzo [a] Anthracene	42.4[*]	<10 - 100	72.3	11 - 150	19.5[*]	<10 - 29
Benzo [b] Fluoranthene	52.6[*]	<10 - 96	104.0	18 - 211	14[*]	<10 - 18
Benzo [k] Fluoranthene	42.1[*]	<10 - 82	76.7	13 - 150	15[*]	<10 - 20
Benzo [a] Pyrene	59.9[*]	130 - <10	69.3	16 - 130	16[*]	<10 - 22
Benzo [g,h,i] perylene	63.4[*]	<10 - 110	13.0[*]	<10 - 19	<10[$]	<10[@]
Chrysene	46.7[*]	<10 - 100	46.7[*]	<10 - 120	<10[$]	<10[@]
Dibenzo [a,h] anthracene	12.1[*]	<10 - 19	41.3[*]	<10 - 97	<10[$]	<10[@]
Fluoranthene	85.1[*]	<10 - 190	72.3	11 - 150	20	11 - 29
Fluorene	<10[$]	<10[@]	104.0	18 - 211	18	18[*]
Ideno-1,2,3-pyrene	55.1[*]	<10 - 99	76.7	13 - 150	16.5	13 - 20
2-Methyl-Naphthalene	22.0[*]	<10 - 30	NA	NA	NA	NA
Naphthalene	49.1	26 - 64	69.3	16 - 130	19	16 - 22
Phenanthrene	37.4[*]	<10 - 94	15.0[*]	<10 - 20	16.5	13 - 20
Pyrene	108.9[*]	<10 - 240	28.0[*]	<10 - 46	39.5	33 - 46

[*] : This mean contains at least one less than value.
[@] : Every variable in this set was this same value.
[$] : All values were less than detection limits.
NA: Not available.

Table II-7 Concluded. Summary of Concentrations of Contaminants in Soils Under Field Conditions (Concentrations in ug/kg, wet-weight basis)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
Pesticides	Mean	Range	Mean	Range	Mean	Range
Aldrin	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
a-BHC	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
b-BHC	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
d-BHC	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
g-BHC	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Chlordane	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
4,4-DDD	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
4,4-DDE	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
4,4-DDT	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Dieldrin	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Endosulfan I	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Endosulfan II	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Endosulfan sulfate	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Endrin	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Endrin Aldehyde	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Heptachlor	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Heptachlor Epoxide	3.09[*]	3.6 - <3.0	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Methoxychlor	<3.0[$]	<3.0[●]	<3.7[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]
Toxaphene	<115.6[$]	<200 - <3.0	<4.0[$]	<3.0 - <5.0	<3.0[$]	<3.0[●]

[*] : This mean contains at least one less than value.
[●] : Every variable in this set was this same value.
[$] : All values were less than detection limits.

Table II-8 Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, dry-weight basis)

		Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
		Mean	Range	Mean	Range	Mean	Range
Metals							
As:	*Spartina*	1.14[*]	<0.86 - 1.82	NA	NA	NA	NA
	Salicornia	0.91[*]	<0.003 - 2.20	<0.94[$]	<0.92 - <0.95	NA	NA
	Scirpus	NA	NA	<1.46[$]	<0.71 - <4.2	0.85[*]	0.79 - <0.87
	Typha	NA	NA	<0.81[$]	<0.77 - <0.87	<0.88[$]	<0.83 - <0.91
Cr:	*Spartina*	6.65[*]	2.5 - 8.9	NA	NA	NA	NA
	Salicornia	4.99[*]	0.4 - 25.4	2.65	1.7 - 3.6	NA	NA
	Scirpus	NA	NA	4.34[*]	3.3 - 6.4	2.33	0.7 - 4.0
	Typha	NA	NA	<3.65[$]	<3.4 - <4.1	5.83[*]	<4.0 - 8.0
Cu:	*Spartina*	8.05	4.35 - 13.9	NA	NA	NA	NA
	Salicornia	10.7	6.52 - 19.1	10.75	10.1 - 11.4	NA	NA
	Scirpus	NA	NA	7.36	5.52 - 10.13	19.4	13.6 - 31.1
	Typha	NA	NA	6.14	4.06 - 10.18	6.53	4.0 - 9.41
Ni:	*Spartina*	5.20	1.96 - 9.29	NA	NA	NA	NA
	Salicornia	4.45[*]	<0.93 - 19.20	2.82	1.85 - 3.78	NA	NA
	Scirpus	NA	NA	3.93	1.97 - 4.26	6.59	4.47 - 9.39
	Typha	NA	NA	2.41	2.16 - 2.64	5.35	4.27 - 9.40
Pb:	*Spartina*	2.81[*]	0.60 - 4.90	NA	NA	NA	NA
	Salicornia	2.07[*]	0.23 - 5.40	0.85	0.71 - 0.99	NA	NA
	Scirpus	NA	NA	2.04[*]	1.18 - 2.50	0.79	0.49 - 1.03
	Typha	NA	NA	2.05[*]	<1.9 - 2.19	2.8[*]	<2.1 - 4.0
Se:	*Spartina*	0.73[*]	<0.63 - 0.85	NA	NA	NA	NA
	Salicornia	<0.82[$]	<0.63 - <2.20[$]	<0.70 -	<0.71	NA	NA
	Scirpus	NA	NA	<0.61[$]	<0.58 - <0.65	<0.61[$]	<0.56 - <0.6
	Typha	NA	NA	<0.65[$]	<0.63 - <0.69	<0.63[$]	<0.62 - <0.6
Zn:	*Spartina*	45.7	21.2 - 98.0	NA	NA	NA	NA
	Salicornia	30.6	12.04 - 57.4	30.3	29.8 - 30.8	NA	NA
	Scirpus	NA	NA	40.1	27.2 - 48.4	92.7	59.3 - 133.
	Typha	NA	NA	19.2	17.8 - 19.0	71.9	34.3 - 98.8
Cd:	*Spartina*	0.076	0.032 - 0.22	NA	NA	NA	NA
	Salicornia	0.109	0.05 - 0.29	0.12	0.07 - 0.17	NA	NA
	Scirpus	NA	NA	0.24	0.08 - 0.37	0.18	0.13 - 0.24
	Typha	NA	NA	0.064	0.035 - 0.100	0.11	0.07 - 0.14
Hg:	*Spartina*	0.016	0.008 - 0.027	NA	NA	NA	NA
	Salicornia	0.022	0.01 - 0.038	0.027	0.019 - 0.034	NA	NA
	Scirpus	NA	NA	0.024	0.012 - 0.038	0.035	0.018 - 0.0
	Typha	NA	NA	0.019	0.012 - 0.026	0.014	0.010 - 0.0

[*] : This mean contains at least one less than value.
● : Every variable in this set was this same value.
[$] : All values were less than detection limits.
NA: Not applicable. No plants of this species at this site.

Table II-8 Continued. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
Butyltins						
Tetrabutyltin:						
Spartina	3.24*	<2.1 - 2.7	NA	NA	NA	NA
Salicornia	6.65*	<1.6 - 54.7	2.75*	<3.1 - 2.4	NA	NA
Scirpus	NA	NA	3.88*	1.2 - 6.1	3.93*	1.2 - 5.5
Typha	NA	NA	8.7^	2.2 - 11.4	12.33*^	<3.2 - 18.3
Tributyltin:						
Spartina	4.82*	<2.5 - 9.2	NA	NA	NA	NA
Salicornia	7.51*^	<1.8 - 35.8	4.6	4.4 - 4.8	NA	NA
Scirpus	NA	NA	8.02^	2.2 - 14.7	4.97	2.2 - 5.6
Typha	NA	NA	4.13^	2.2 - 5.7	5.78*^	<3.6 - 8.4
Dibutyltin:						
Spartina	3.07*	<2.1 - 3.7	NA	NA	NA	NA
Salicornia	5.18*	<1.4 - 13.2	2.6*	<3.0 - 2.2	NA	NA
Scirpus	NA	NA	3.78*	<2.9 - 6.7	3.43*	1.1 - 5.6
Typha	NA	NA	3.0^	2.5 - 3.7	3.45*^	2.3 - 4.4
Monobutyltin:						
Spartina	4.78*	<1.9 - 19.8	NA	NA	NA	NA
Salicornia	15.6*	<1.3 - 64.3	20.35	5.6 - 35.1	NA	NA
Scirpus	NA	NA	4.2*	<2.9 - 5.0	5.87*^	<3.7 - 9.5
Typha	NA	NA	7.45*^	<2.2 - 14.0	4.7*^	<3.0 - 7.0
PCBs						
Aroclor 1016						
Spartina	<73.3$	<20 - <100	NA	NA	NA	NA
Salicornia	<55.0$	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100$	<100●	<20$	<20●
Typha	NA	NA	<100$	<100●	<100$	<100●
Aroclor 1221						
Spartina	<73.3$	<20 - <100	NA	NA	NA	NA
Salicornia	<55.0$	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100$	<100●	<20$	<20●
Typha	NA	NA	<100$	<100●	<100$	<100●
Aroclor 1232						
Spartina	<73.3$	<20 - <100	NA	NA	NA	NA
Salicornia	<55.0$	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100$	<100●	<20$	<20●
Typha	NA	NA	<100$	<100●	<100$	<100●

* : This mean contains at least one less than value.
● : Every variable in this set was this same value.
$: All values were less than detection limits.
^ : Indicates analyte detected in the blank.
NA: Not applicable. No plants of this species at these sites.

Table II-8 Continued. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
PCBs						
Aroclor 1242						
Spartina	<73.3[$]	<20 - <100	NA	NA	NA	NA
Salicornia	<55.0[$]	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100[$]	<100[●]	<20[$]	<20[●]
Typha	NA	NA	<100[$]	<100[●]	<100[$]	<100[●]
Aroclor 1248						
Spartina	<73.3[$]	<20 - <100	NA	NA	NA	NA
Salicornia	<60[$]	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100[$]	<100[●]	<20[$]	<20[●]
Typha	NA	NA	<100[$]	<100[●]	<100[$]	<100[●]
Aroclor 1254						
Spartina	<73.3[$]	<20 - <100	NA	NA	NA	NA
Salicornia	<60[$]	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100[$]	<100[●]	<20[$]	<20[●]
Typha	NA	NA	<100[$]	<100[●]	<100[$]	<100[●]
Aroclor 1260						
Spartina	<73.3[$]	<20 - <100	NA	NA	NA	NA
Salicornia	<60[$]	<20 - <100	NA	NA	NA	NA
Scirpus	NA	NA	<100[$]	<100[●]	<20[$]	<20[●]
Typha	NA	NA	<100[$]	<100[●]	<100[$]	<100[●]
PAHs						
Acenaphthene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Acenaph-thylene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Anthracene						
Spartina	11.3[*]	<10 - 26	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]

[*] : This mean contains at least one less than value.
[●] : Every variable in this set was this same value.
[$] : All values were less than detection limits.
NA: Not applicable. No plants of this species at these sites.

Table II-8 Continued. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
PAHs						
Benzo [a] Anthracene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Benzo [b] Fluoranthene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Benzo [b] Fluoranthene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Benzo [k] Fluoranthene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Benzo [a] Pyrene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Benzo [g,h,i] perylene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Chrysene						
Spartina	<10[$]	<10[●]	NA	NA	NA	NA
Salicornia	<10[$]	<10[●]	<10[$]	<10[●]	NA	NA
Scirpus	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]
Typha	NA	NA	<10[$]	<10[●]	<10[$]	<10[●]

* : This mean contains at least one less than value.
● : Every variable in this set was this same value.
$: All values were less than detection limits.
NA: Not applicable/Not available. No plants of this species at these sites.

Table II-8 Continued. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
Dibenzo [a,h] anthracene						
Spartina	<10$	<10●	NA	NA	NA	NA
Salicornia	<10$	<10●	<10$	<10●	NA	NA
Scirpus	NA	NA	<10$	<10●	<10$	<10●
Typha	NA	NA	<10$	<10●	<10$	<10●
Fluoranthene						
Spartina	<10$	<10●	NA	NA	NA	NA
Salicornia	10.06*	<10 - 11	<10$	<10●	NA	NA
Scirpus	NA	NA	<10$	<10●	<10$	<10●
Typha	NA	NA	<10$	<10●	<10$	<10●
Fluorene						
Spartina	10.42*	<10 - 15	NA	NA	NA	NA
Salicornia	10.06*	<10 - 11	<10$	<10●	NA	NA
Scirpus	NA	NA	<10$	<10●	<10$	<10●
Typha	NA	NA	<10$	<10●	<10$	<10●
Indeno-1,2,3-pyrene						
Spartina	<10$	<10●	NA	NA	NA	NA
Salicornia	<10$	<10●	<10$	<10●	NA	NA
Scirpus	NA	NA	<10$	<10●	<10$	<10●
Typha	NA	NA	<10$	<10●	<10$	<10●
2-Methyl-Naphthalene						
Spartina	24.83*	<20 - 32	NA	NA	NA	NA
Salicornia	24.31*	<20 - 37	NA	NA	NA	NA
Scirpus	NA	NA	NA	NA	NA	NA
Typha	NA	NA	NA	NA	NA	NA
Naphthalene						
Spartina	56.17*	28 - 88	NA	NA	NA	NA
Salicornia	57.31*	16 - 98	<10$	<10●	NA	NA
Scirpus	NA	NA	<10$	<10●	<10$	<10●
Typha	NA	NA	<10$	<10●	<10$	<10●
Phenanthrene						
Spartina	20.5*	<10 - 31	NA	NA	NA	NA
Salicornia	13.69*	<10 - 37	<10$	<10●	NA	NA
Scirpus	NA	NA	14.8*	<10 - 18	15	10 - 18
Typha	NA	NA	12.75*	<10 - 20	12.5*	<10 - 18
Pyrene						
Spartina	10.17*	<10 - 12	NA	NA	NA	NA
Salicornia	10.13*	<10 - 12	<10$	<10●	NA	NA
Scirpus	NA	NA	<10$	<10●	<10$	<10●
Typha	NA	NA	<10$	<10●	<10$	<10●

* : This mean contains at least one less than value.
● : Every variable in this set was this same value.
$: All values were less than detection limits. NA: Not applicable.

Table II-8 Continued. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
Pesticides	Mean	Range	Mean	Range	Mean	Range
Aldrin:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
a-BHC:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	11.02[*]	<2.0[#] - 2.3	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
b-BHC:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
d-BHC:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
g-BHC:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
Chlordane:						
Spartina	<20.7[$]	<2.0 - <30	NA	NA	NA	NA
Salicornia	<16[$]	<2.0 - <30	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
4,4-DDD:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]
4,4-DDE:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[●]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[●]	<2.0[$]	<2.0[●]
Typha	NA	NA	<20	<20	<20[$]	<20[●]

[*] : This mean contains at least one less than value.
[●] : Every variable in this set was this same value.
[$] : All values were less than detection limits.
[#] : There was a less than value much higher than this highest actual number.
NA: Not applicable/Not available. No plants of this species in these sites.

Table II-8 Continued. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
Pesticides						
4,4-DDT:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]
Dieldrin:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]
Endosulfan I:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	11.02[*]	<2.0[#] - 2.3	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]
Endosulfan II:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]
Endosulfan sulfate:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]
Endrin:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]
Endrin Aldehyde:						
Spartina	<14[$]	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11[$]	<2.0 - <20	<2.0[$]	<2.0[@]	NA	NA
Scirpus	NA	NA	<2.0[$]	<2.0[@]	<2.0[$]	<2.0[@]
Typha	NA	NA	<20	<20	<20[$]	<20[@]

@ : Every variable in this set was this same value.
$: All values were less than detection limits.
NA: Not applicable/Not available. No plants of this species at these sites.

Table II-8 Concluded. Summary of Concentrations of Contaminants in Plants Under Field Conditions (Concentrations in ug/kg, wet-weight)

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
Pesticides	Mean	Range	Mean	Range	Mean	Range
Heptachlor:						
Spartina	<14$	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11$	<2.0 - <20	<2.0$	<2.0@	NA	NA
Scirpus	NA	NA	<2.0$	<2.0@	<2.0$	<2.0@
Typha	NA	NA	<20	<20	<20$	<20@
Heptachlor Epoxide:						
Spartina	<14$	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11$	<2.0 - <20	<2.0$	<2.0@	NA	NA
Scirpus	NA	NA	<2.0$	<2.0@	<2.0$	<2.0@
Typha	NA	NA	<20	<20	<20$	<20@
Methoxychlor:						
Spartina	<14$	<2.0 - <20	NA	NA	NA	NA
Salicornia	<11$	<2.0 - <20	<2.0$	<2.0@	NA	NA
Scirpus	NA	NA	<2.0$	<2.0@	<2.0$	<2.0@
Typha	NA	NA	<20	<20	<20$	<20@
Toxaphene:						
Spartina	<123.5$	<2.0 - <200	NA	NA	NA	NA
Salicornia	<80.75$	<2.0 - <200	NA	NA	NA	NA
Scirpus	NA	NA	<2.0$	<2.0@	<2.0$	<2.0@
Typha	NA	NA	<20	<20	<20$	<20@

* : This mean contains at least one less than value.
@ : Every variable in this set was this same value.
$: All values were less than detection limits.
: In this range there was a less than value much higher than this highest actua value.
NA: Not applicable/Not available. No plants of this species at these sites.

Table II-9 Summary of Concentrations of Contaminants in Animals Under Field Conditions (Concentrations in mg/kg metals and ug/kg butyltins)⁼

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
Metals						
As: *Modiolus*	8.85	8.76 - 8.93	NA	NA	NA	NA
Cerithidea	7.78	2.5 - 11.62	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	10.79	10.79@
Cr: *Modiolus*	3.65	3.3 - 4.0	NA	NA	NA	NA
Cerithidea	1.83	1.2 - 2.2	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	4.3	4.3@
Cu: *Modiolus*	21.85	20.5 - 23.1	NA	NA	NA	NA
Cerithidea	63.8	23.5 - 93.6	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	164.1	164.1@
Ni: *Modiolus*	6.54	5.33 - 7.74	NA	NA	NA	NA
Cerithidea	7.73	4.5 - 10.2	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	5.78	5.78@
Pb: *Modiolus*	1.55	1.39 - 1.71	NA	NA	NA	NA
Cerithidea	1.22	0.82 - 1.43	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	1.89	1.89@
Se: *Modiolus*	3.86	3.52 - 4.19	NA	NA	NA	NA
Cerithidea	1.28	1.04 - 1.47	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	3.98	3.98@
Zn: *Modiolus*	71.4	71.1 - 71.7	NA	NA	NA	NA
Cerithidea	280.5	131.4 - 309	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	273.0	273.0@
Cd: *Modiolus*	3.49	3.45 - 3.53	NA	NA	NA	NA
Cerithidea	0.80	0.34 - 1.03	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	3.34	3.34@
Hg: *Modiolus*	0.351	0.304 - 0.398	NA	NA	NA	NA
Cerithidea	0.136	0.055 - 0.180	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	0.469	0.469@
Butyltins						
Tetrabutyltin						
Modiolus	<4.45$	<3.9 - <5.0	NA	NA	NA	NA
Cerithidea	<1.00$	<0.6 - <1.4	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	14.6	14.6@
Tributyltin						
Modiolus	36.6	34.9 - 38.3	NA	NA	NA	NA
Cerithidea	2.2	1.4 - 3.5	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	40.7	40.7@

⁼ : Dry-weight basis for metals; wet-weight for butyltins.
@ : Every variable in this set was this same value.
$: All values were less than detection limits.
NA : Not applicable/Not available. No animals of this species at this site.
Note : There were no animals analyzed from the estuarine sites.

Table II-9 Continued. Summary of Concentrations of Contaminants in Animals Under Field Conditions (Concentrations in ug/kg, wet-weight)[=]

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
Butyltins						
Dibutyltin						
Modiolus	7.15[*]	<5.0 - 9.3	NA	NA	NA	NA
Cerithidea	2.55	0.9 - 4.2	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	30.1	30.1[@]
Monobutyltin						
Modiolus	6.2[*]	<4.6 - 7.8	NA	NA	NA	NA
Cerithidea	1.65	1.6 - 1.7	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	11.8	11.8[@]
PCBs						
Aroclor 1016						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]
Aroclor 1221						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]
Aroclor 1232						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]
Aroclor 1242						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]
Aroclor 1248						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]
Aroclor 1254						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]
Aroclor 1260						
Modiolus	<100[$]	<100[@]	NA	NA	NA	NA
Cerithidea	<100[$]	<100[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<100[$]	<100[@]

[=] : Note - there were no animals analyzed from the estuarine sites.
[*] : This mean contains at least one less than value.
[@] : Every variable in this set was this same value.
[$] : All values were less than detection limits.
NA : Not applicable/Not available. No animals of this species at this site.

Table II-9 Continued. Summary of Concentrations of Contaminants in Animals Under Field Conditions (Concentrations in ug/kg, wet-weight)[=]

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
	Mean	Range	Mean	Range	Mean	Range
PAHs						
Acenaphthene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Acenaphthylene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Anthracene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Benzo [a] Anthracene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Benzo [b] Fluoranthene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Benzo [k] Fluoranthene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Benzo [a] Pyrene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Benzo [g,h,i] Perylene						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]

= : Note; there were no animals analyzed from the estuarine sites.
* : This mean contains at least one less than value.
● : Every variable in this set was this same value.
$: All values were less than detection limits.
NA : Not applicable/Not available. No animals of this species at this site.

Table II-9 Continued. Summary of Concentrations of Contaminants in Animals Under Field Conditions (Concentrations in ug/kg, wet-weight)[=]

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
PAHs	Mean	Range	Mean	Range	Mean	Range
Chrysene						
Modiolus	<10[$]	<10[@]	NA	NA	NA	NA
Cerithidea	10.5[*]	<10 - 11	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Dibenzo [a,h] Anthracene						
Modiolus	<10[$]	<10[@]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Fluoranthene						
Modiolus	<10[$]	<10[@]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Fluorene						
Modiolus	<10[$]	<10[@]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Indeno-1,2,3-pyrene						
Modiolus	<10[$]	<10[@]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
2-Methyl-Naphthalene						
Modiolus	37.5[*]	<30 - 45	NA	NA	NA	NA
Cerithidea	<30[$]	<30[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	NA	NA
Naphthalene						
Modiolus	90.5[*]	61 - 120	NA	NA	NA	NA
Cerithidea	<60[$]	<60[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Phenanthrene						
Modiolus	25.5	14 - 37	NA	NA	NA	NA
Cerithidea	<10[$]	<10[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Pyrene						
Modiolus	18[*]	<10 - 26	NA	NA	NA	NA
Cerithidea	<10[$]	<10[@]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]
Corbicula	NA	NA	NA	NA	<10[$]	<10[@]

[=] : Note; there were no animals analyzed from the estuarine sites.
[*] : This mean contains at least one less than value.
[@] : Every variable in this set was this same value.
[$] : All values were less than detection limits.
NA : Not applicable/Not available. No animals of this species at this site.

Table II-9 Continued. Summary of Concentrations of Contaminants in Animals Under Field Conditions (Concentrations in ug/kg, wet-weight)[=]

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
Pesticides	Mean	Range	Mean	Range	Mean	Range
Aldrin						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
a-BHC						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
b-BHC						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<12[$]	<12[●]
d-BHC						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<24[$]	<24[●]
g-BHC						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Chlordane						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
4,4-DDD						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
4,4-DDE						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<115[$]	<115[●]
4,4-DDT						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<30[$]	<30[●]
Dieldrin						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<16[$]	<16[●]

= : Note; there were no animals analyzed from the estuarine sites.
● : Every variable in this set was this same value.
$: All values were less than detection limits.
NA : Not applicable/Not available. No animals of this species at this site.

Table II-9 Concluded. Summary of Concentrations of Contaminants in Animals Under Field Conditions (Concentrations in ug/kg wet-weight)[‾]

	Marine Sites: 1 - 8		Estuarine Sites: 9, 10, and 14		Freshwater Sites: 11 - 13	
Pesticides	Mean	Range	Mean	Range	Mean	Range
Endosulfan I						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Endosulfan II						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Endosulfan Sulfate						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Endrin						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	18[$]	18[●]
Endrin Aldehyde						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Heptachlor						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	42[$]	42[●]
Heptachlor Epoxide						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Methoxychlor						
Modiolus	<10[$]	<10[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	<10[$]	<10[●]
Toxaphene						
Modiolus	<500[$]	<500[●]	NA	NA	NA	NA
Cerithidea	<10[$]	<10[●]	NA	NA	NA	NA
Corbicula	NA	NA	NA	NA	NA	NA

‾ : Note; there were no animals analyzed from the estuarine sites.
● : Every variable in this set was this same value.
$: All values were less than detection limits.
NA : Not applicable/Not available. No animals of this species at this site.

III. CONCLUSIONS AND RECOMMENDATIONS

The naturally-occurring wetlands in the San Francisco Bay area and the adjacent estuarine and fresh water areas appear to contain relatively low levels of most metal, PCB, PAH, butyltin, and pesticide contaminants in soil/sediment, plants, and animals. Metals such as lead, chromium and arsenic appeared to have elevated concentrations in some plants and animals. There is, however, a very depauperate faunal component in all the naturally occurring wetlands surveyed, that may be the result of a more subtle impact. The introduction and proliferation of a tiny exotic clam from Asia, <u>Potamocorbula</u> <u>amurensis</u> may be a contributing factor. This species out-competes and is a more efficient feeder than existing species. In the brackish and freshwater sites, the clam <u>Corbicula</u> was represented also by many shells and only a few live animals. The invasion of <u>Potamocorbula</u> <u>amurensis</u> also includes brackish waters such as in Suisun Bay. Snails were equally scarce on all sites but Site 8. This lack of animals is quite peculiar since the snails, and mussels are invasive species from the U. S. East Coast, and the clams are an equally opportunistic species from Asia. While it is likely that the introduction of the exotic species (<u>Nassarius</u>, <u>Modiolus</u>, and <u>Corbicula</u>) accompanied some disturbance of the California wetlands, these are very hardy species and would have been expected to survive subsequent disturbances. However, <u>Potamocorbula</u> <u>amurensis</u> could even be out-competing these species. This survey was conducted toward the end of a five year drought experienced in the region. This climatic condition no doubt influenced the existing fauna available for sampling. Further documentation of the fauna of the San Francisco Bay area wetlands appears to be warranted. In addition, further evaluation of the status of arsenic, lead and chromium in wetland foodwebs in the San Francisco Bay area.

The data presented in this report establishes an initial baseline for wetlands in the San Francisco Bay Area and can be used to interpret wetland test results for wetland creation or restoration projects. As more information becomes available, this baseline should be updated to include all ongoing and future data collection activities.

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APPENDIX A

Field Survey

Plant and Animal Tissue Concentrations

a. Plant Codes

SPA Spartina Foliosa
SCI Scirpus olynei
SAL Salicornia subterminalis
TYP Typha latifolia

b. Animal Codes

SN Cerithidea ?
CB Corbicula fluminea
MO Modiolus demissus

PLANT METAL RESULTS

(Concentrations in mg/kg Dry Weight, ppm)

Battelle Code	Sponsor Code	As	Cr	Cu	Ni	Pb	Se	Zn	Ag	Cd	Hg
245-1	R5B-SPA	1.1 U	5.1 U	8.86	3.29	2.7 U	0.81 U	44.9	0.2	0.22	0.008
245-2	R4B-SPA	1.2 U	6.9 U	6.43	3.24	4.9	0.85 U	25.9	0.13	0.043	0.012
245-3	R7A-SPA	1.1 U	6 U	4.64	4.29	3.6	0.79 U	28.5	0.07	0.043	0.009
245-4,5,6,	R2A-SPA-1,2,3	1.2 U	8.9	6.44	4.61	3.0	0.85 U	30.5	0.14	0.063	0.02
245-7	R1A-SPA	0.96 U	4.7 U	4.63	1.96	4.0	0.74 U	27.6	0.11	0.055	0.006
245-8,9	R2B-SPA-1,2	1.1 U	6.3 U	7.2	4.11	4.7	0.76 U	34.8	0.23	0.066	0.02
245-10	RID-SAL-1	0.94	3.7 U	10.45	2.71	2.4 U	0.70 U	16.6	0.01	0.069	0.012
245-11	RID-SAL-2	0.96 U	3.7 U	11.46	2.68	2.5 U	0.72 U	20.0	0.02	0.093	0.016
245-12,14	RIC-SAL-1,3	1.0 U	4.2	7.92	3.07	4.1	0.77 U	18.0	0.01	0.051	0.01
245-13,15	RIC-SAL-2,4	1.2 U	4.8 U	8.93	2.47	2.9 U	0.87 U	18.5	0.02	0.082	0.017
245-16,18	R2D-SAL-1,3	1.1 U	10.6	13.9	6.07	3.9	0.78 U	31.5	0.03	0.089	0.022
245-17.19	R2D-SAL-2,4	0.96 U	5.2 U	11.7	3.03	4.6	0.74 U	23.2	0.01 U	0.1	0.014
245-20,21	R13C-TYP-1,2	0.87 U	4.2 U	5.12	4.27	2.8	0.62 U	34.3	0.01 U	0.07	0.016
245-22,23	R13B-TYP-1,2	0.9 U	8	7.59	9.40	2.3	0.63 U	93.6	0.01 U	0.14	0.015
245-24,25	R13D-TYP-1,2	0.83 U	4 U	4	8.31	2.1 U	0.62 U	98.8	0.01 U	0.09	0.01
245-26	R13A-TYP	0.91 U	7.1 U	9.41	7.40	4.0	0.66 U	61.0	0.01 U	0.13	0.014
245-27	R10D-TYP	0.87 U	4.1 U	10.18	2.54	2.1 U	0.69 U	21.3	0.03	0.1	0.012
245-28	R10A-TYP	0.79 U	3.4 U	4.06	2.28	2.0 U	0.63 U	19.0	0.01 U	0.035	0.016
245-29	R10C-TYP	0.79 U	3.5 U	5.36	2.64	2.19	0.63 U	18.6	0.02	0.055	0.022
245-30,31	R10B-TYP-1,2	0.77 U	3.6 U	4.95	2.16	1.9 U	0.63 U	17.8	0.02	0.067	0.026
245-32	R7B-SPA	0.99 U	8.9	6.1	7.40	2.7	0.72 U	25.5	0.06	0.064	0.017
245-33	R1B-SPA	0.86 U	7.1	4.35	4.34	2.2	0.64 U	21.2	0.12	0.032	0.015
245-34,35,36 REP 1	R9B-SCI-1,2,3 REP 1	0.82 U	3.9	6.64	7.92	2.50	0.62 U	43.5	0.06	0.37	0.026
245-34,35,36 REP 2	R9B-SCI-1,2,3 REP 2	0.82 U	3.6 U	7.72	9.95	2.1 U	0.63 U	49.2	0.05	0.38	0.024
245-37	R9C-SCI	0.03 U	4.2 U	10.13	2.03	2.50	0.65 U	39.7	0.09	0.35	0.012
245-38,39	R9D-SCI-1,2	0.79 U	3.9	5.52	1.97	2.00 U	0.58 U	27.2	0.04	0.19	0.024
245-40,41,42 REP 1	R9A-SCI-1,2,3 REP 1	0.71 U	6.4	6.83	4.26	2.00 U	0.60 U	41.7	0.05	0.2	0.02
245-40,41,42 REP 2	R9A-SCI-1,2,3 REP 2	0.75 U	4.4	8.4	5.65	2.0 U	0.60 U	41.3	0.05	0.19	0.021
245-43	R7C-SAL-1	1.14	6.6	8.79	5.37	2.30 U	0.69 U	19.5	0.02	0.067	0.011
245-44	R7-SAL-2	0.93 U	5.7 U	8.88	4.04	2.40 U	0.79 U	22.4	0.02	0.14	0.017
245-45	R5C-SAL-1	0.62 U	6.8	8.68	5.66	2.80	0.65 U	15.7	0.02	0.039	0.012
245-46	R5C-SAL-2	1.18	7.9 U	10.5	5.40	2.60 U	0.90 U	45.2	0.01 U	0.083	0.013
245-47	R4D-SAL-1	0.76 U	4.6	6.52	1.66	2.10 U	0.63 U	12.04	0.01	0.094	0.014
245-48	R4D-SAL-2	0.91 U	8	11.09	2.14	2.40 U	0.79 U	30.7	0.02	0.16	0.019
245-49	R7D-SAL-1	2.20	25.4	17.7	19.20	5.40	0.73 U	37.5	0.05	0.1	0.059
245-50	R7D-SAL-2	1.00 U	7.7	8.94	2.96	2.60 U	0.86 U	22.6	0.01 U	0.1	0.016
Procedural Blank		N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	0.01 U	0.004 U

U indicates analyte not detected at detection limit shown
N/A indicates not applicable. Note: procedural blanks are not appropriate for XRF analyses.

STANDARD REFERENCE MATERIAL (Concentrations in mg/kg Dry Weight, ppm)

Battelle Code	Sponsor Code	As	Cr	Cu	Ni	Pb *	Se	Zn	Ag	Cd	Hg
SRM 1571 ORCHARD LEAVES, REP 1		11.2	4.3 U	12.7	1.07	45.7	0.77 U	27.8	0.01 U	0.15	0.129
SRM 1571 ORCHARD LEAVES, REP 1A		8.72	4.1 U	12.4	1.57	48.5	0.70 U	26.2	0.01 U	0.16	
SRM 1571 ORCHARD LEAVES, REP 2		10.54	3.6 U	11.68	1.49	43.5	0.60 U	25.1			
SRM 1571 ORCHARD LEAVES, REP 2A		9.97	3.5 U	11.23	1.20	43.3	0.60 U	23.9			
SRM 1571 ORCHARD LEAVES, REP 3		10.1	5	10.75	1.05	43.5	0.59 U	25.8			
	Certified Value:	14 ±2	NC	12 ± 1	1.3 ±0.2	45 ±3	0.08 ±0.01	25 ±3	NC	0.11 ±0.02	0.155 ±0.015
SRM 1566A OYSTER TISSUE (RICHLAND), REP 1		14.43	3.3 U	65.7	2.20	2.9	2.03	872.0	1.28	4.09	0.059
SRM 1566A OYSTER TISSUE (MSL), REP 1		13.59	3.5	68.4	2.05	3.6	2.04	892.0	1.46	4.15	
SRM 1566A OYSTER TISSUE (RICKLAND), REP 2		14.98	4.6	64.7	2.20	2.0 U	2.36	817.0			
SRM 1566A OYSTER TISSUE (MSL), REP 2		14.95	3.1 U	64.7	2.18	2.5	2.02	837.0			
SRM 1566A OYSTER TISSUE (RICHLAND), REP 3		13.35	3.1 U	62.7	2.14	2.1	2.17	845.0			
SRM 1566A OYSTER TISSUE (MSL), REP 3		14.93	3.3 U	64.6	1.85	1.9 U	2.27	884.0			
	Certified Value:	14 ±1.2	1.43 ±0.46	66.6 ± 4.3	2.25 ±0.44	:71 ±0.014*	2.21 ±0.24	830 ±57	1.68 ±0.15	4.15 ±0.38	0.0642 ±.0067

* Lead determined by ICP-MS, not XRF.

PAH RESULTS FOR WES PLANT SAMPLES   cl# 245

(Concentrations in ug/Kg Dry Weight, ppb)

Battelle Code	Sponsor Code	Date Ext'd	Date Anal'd	% Moist.	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo[a] Anthra-cene	Benzo[b] Fluor-anthene	Benzo[k] Fluor-anthene	Benzo[a] pyrene	Benzo-(g,h,i)-perylene
BLANK 1	BLANK 1	3/18/91	4/11/91	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-1	R5B-SPA	3/18/91	4/11/91	86	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-2	R4B-SPA	3/18/91	4/11/91	85	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-3	R7A-SPA	3/18/91	4/11/91	81	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-4,5,6,	R2A-SPA-1,2,3	3/18/91	4/11/91	80	10 U	10 U	26	10 U	10 U	10 U	10 U	10 U
245-7	R1A-SPA	3/18/91	4/11/91	82	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-8,9	R2B-SPA-1,2	3/18/91	4/11/91	85	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-10	RID-SAL-1	3/18/91	4/11/91	73	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-11	RID-SAL-2	3/18/91	4/11/91	91	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-12,14	RIC-SAL-1,3	3/18/91	4/11/91	72	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-13,15	RIC-SAL-2,4	3/18/91	4/11/91	89	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-16,18	R2D-SAL-1,3	3/18/91	4/11/91	73	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-17,19	R2D-SAL-2,4	3/18/91	4/11/91	85	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BLANK 2	BLANK 2	11/29/90	12/12/90	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-20,21	R13C-TYP-1,2	11/29/90	12/12/90	86	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-22,23	R13B-TYP-1,2	11/29/90	12/12/90	88	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-24,25	R13D-TYP-1,2	11/29/90	12/12/90	81	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-26	R13A-TYP	12/13/90	12/14/90	90	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-27	R10D-TYP	11/29/90	12/12/90	88	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-28	R10A-TYP	11/29/90	12/12/90	85	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-29	R10C-TYP	11/29/90	12/12/90	81	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-30,31	R10B-TYP-1,2	11/29/90	12/12/90	82	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-32	R7B-SPA	11/29/90	12/12/90	80	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-33	R1B-SPA	12/13/90	12/14/90	86	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-33, DUP	R1B-SPA, DUP	12/13/90	12/14/90	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/12/90	77	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-37	R9C-SCI	11/29/90	12/13/90	80	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BLANK 3	BLANK 3	11/30/90	12/13/90	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-38,39	R9D-SCI-1,2	11/30/90	12/13/90	82	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-38,39 DUP	R9D-SCI-1,2	11/30/90	12/13/90	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/13/90	75	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-43	R7C-SAL-1	11/30/90	12/13/90	78	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-44	R7-SAL-2	11/30/90	12/13/90	93	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-45	R5C-SAL-1	11/30/90	12/13/90	74	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-46	R5C-SAL-2	11/30/90	12/13/90	89	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-47	R4D-SAL-1	11/30/90	12/13/90	76	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-48	R4D-SAL-2	11/30/90	12/13/90	88	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-49	R7D-SAL-1	11/30/90	12/13/90	80	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
245-50	R7D-SAL-2	11/30/90	12/13/90	89	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

U indicates analyte not detected at detection limit shown
B indicates analyte present in blank associated with that sample (one method blank was run on each date)
NA indicates not applicable

PAH RESULTS FOR WES PLANT SAMPLES

(Concentrations in ug/Kg Dry Weight, ppb)

Battelle Code	Sponsor Code	Date Ext'd	Date Anal'd	Chrysene	Dibenzo-(a,h)-anthracene	Fluor-anthene	Fluorene	Indeno-1,2,3-Pyrene	2-Methyl-Naphthene	Naph-thalene	Phenan-threne	Pyrene
BLANK 1	BLANK 1	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
245-1	R5B-SPA	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
245-2	R4B-SPA	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	30	63	38	10 U
245-3	R7A-SPA	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	28	54	37	10 U
245-4,5,6,	R2A-SPA-1,2,3	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	21	50 U	30	10 U
245-7	R1A-SPA	3/18/91	4/11/91	10 U	10 U	10 U	15	10 U	29	63	31	10 U
245-8,9	R2B-SPA-1,2	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	32	50 U	20	10 U
245-10	RID-SAL-1	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	20 U	50 U	48	10 U
245-11	RID-SAL-2	3/18/91	4/11/91	15	10 U	10 U	10 U	10 U	190	380	130	10 U
245-12,14	RIC-SAL-1,3	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	20	50	10	10 U
245-13,15	RIC-SAL-2,4	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	20 U	50 U	28	10 U
245-16,18	R2D-SAL-1,3	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	37	98	10 U	10 U
245-17,19	R2D-SAL-2,4	3/18/91	4/11/91	10 U	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
BLANK 2	BLANK 2	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	20 U	20 U	10 U	10 U
245-20,21	R13C-TYP-1,2	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	38	92	18	10 U
245-22,23	R13B-TYP-1,2	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	20 U	42	10 U	10 U
245-24,25	R13D-TYP-1,2	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	20 U	22	10 U	10 U
245-26	R13A-TYP	12/13/90	12/14/90	10 U	10 U	10 U	10 U	10 U	20 U	47	12	10
245-27	R10D-TYP	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	28	65	20	10 U
245-28	R10A-TYP	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	29	63	10 U	10 U
245-29	R10C-TYP	11/29/90	12/12/90	10 U	27	10 U	10 U	10 U	22	51	11	10 U
245-30,31	R10B-TYP-1,2	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	20 U	25	10 U	10 U
245-32	R7B-SPA	11/29/90	12/12/90	10 U	10 U	10 U	10 U	10 U	20 U	28	12	12
245-33	R1B-SPA	12/13/90	12/14/90	10 U	10 U	10 U	10 U	10 U	20 U	42	13	10 U
245-33, DUP	R1B-SPA, DUP	12/13/90	12/14/90	10 U	10 U	16	10 U	10 U	20 U	48	18	19
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/12/90	10 U	10 U	13	10 U	10 U	20 U	18	18	11
245-37	R9C-SCI	11/29/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	20 U	10 U	10 U
BLANK 3	BLANK 3	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	30 U	10 U	10 U
245-38,39	R9D-SCI-1,2	11/30/90	12/13/90	10 U	10 U	11	10 U	10 U	20 U	30 U	11	10 U
245-38,39 DUP	R9D-SCI-1,2	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	30 U	10	10 U
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/13/90	10 U	21	22	10 U	10 U	20 U	30 U	17	19
245-43	R7C-SAL-1	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	30 U	10 U	10 U
245-44	R7-SAL-2	11/30/90	12/13/90	10 U	10 U	13	10 U	10 U	20 U	49	21	13
245-45	R5C-SAL-1	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	30 U	10 U	10 U
245-46	R5C-SAL-2	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	30 U	10 U	10 U
245-47	R4D-SAL-1	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	30 U	10 U	10 U
245-48	R4D-SAL-2	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	41	11	10 U
245-49	R7D-SAL-1	11/30/90	12/13/90	10 U	10 U	11	10 U	10 U	20 U	30 U	10 U	12
245-50	R7D-SAL-2	11/30/90	12/13/90	10 U	10 U	10 U	10 U	10 U	20 U	31	11	10 U

U indicates analyte not detected at detection limit shown
B indicates analyte present in blank associated with that sa
NA indicates not applicable

PAH RESULTS FOR WES PLANT SAMPLES

(Concentrations in ug/Kg Dry Weight, ppb)

SURROGATE PERCERNT RECOVERIES

Battelle Code	Sponsor Code	Date Ext'd	Date Anal'd	Naph- d8	Acen- d10	Phenan- d10?Q	B[a]P- d12	Fluorene- d10	Chrysene- d12
BLANK 1	BLANK 1	3/18/91	4/11/91	98%	NA	NA	NA	56%	110%
245-1	R5B-SPA	3/18/91	4/11/91	36%	NA	NA	NA	35%	37%
245-2	R4B-SPA	3/18/91	4/11/91	110%	NA	NA	NA	120%	110%
245-3	R7A-SPA	3/18/91	4/11/91	79%	NA	NA	NA	100%	85%
245-4,5,6,	R2A-SPA-1,2,3	3/18/91	4/11/91	100%	NA	NA	NA	110%	110%
245-7	R1A-SPA	3/18/91	4/11/91	120%	NA	NA	NA	130%	110%
245-8,9	R2B-SPA-1,2	3/18/91	4/11/91	76%	NA	NA	NA	92%	82%
245-10	RID-SAL-1	3/18/91	4/11/91	110%	NA	NA	NA	130%	130%
245-11	RID-SAL-2	3/18/91	4/11/91	110%	NA	NA	NA	120%	130%
245-12,14	RIC-SAL-1,3	3/18/91	4/11/91	36%	NA	NA	NA	35%	37%
245-13,15	RIC-SAL-2,4	3/18/91	4/11/91	96%	NA	NA	NA	100%	91%
245-16,18	R2D-SAL-1,3	3/18/91	4/11/91	94%	NA	NA	NA	100%	100%
245-17,19	R2D-SAL-2,4	3/18/91	4/11/91	22%	NA	NA	NA	20%	23%
BLANK 2	BLANK 2	11/29/90	12/12/90	30 %	50 %	73 %	120 %		
245-20,21	R13C-TYP-1,2	11/29/90	12/12/90	72 %	83 %	78 %	120 %		
245-22,23	R13B-TYP-1,2	11/29/90	12/12/90	73 %	85 %	80 %	120 %		
245-24,25	R13D-TYP-1,2	11/29/90	12/12/90	84 %	97 %	91 %	136 %		
245-26	R13A-TYP	12/13/90	12/14/90	52 %	63 %	62 %	91 %		
245-27	R10D-TYP	11/29/90	12/12/90	78 %	90 %	81 %	130 %		
245-28	R10A-TYP	11/29/90	12/12/90	60 %	68 %	63 %	95 %		
245-29	R10C-TYP	11/29/90	12/12/90	75 %	87 %	79 %	125 %		
245-30,31	R10B-TYP-1,2	11/29/90	12/12/90	69 %	83 %	77 %	120 %		
245-32	R7B-SPA	11/29/90	12/12/90	35 %	65 %	72 %	110 %		
245-33	R1B-SPA	12/13/90	12/14/90	46 %	65 %	63 %	95 %		
245-33, DUP	R1B-SPA, DUP	12/13/90	12/14/90	76 %	87 %	78 %	120 %		
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/12/90	46 %	51 %	50 %	73 %		
245-37	R9C-SCI	11/29/90	12/13/90	28 %	65 %	77 %	125 %		
BLANK 3	BLANK 3	11/30/90	12/13/90	31 %	44 %	63 %	110 %		
245-38,39	R9D-SCI-1,2	11/30/90	12/13/90	60 %	79 %	75 %	120 %		
245-38,39 DUP	R9D-SCI-1,2	11/30/90	12/13/90	59 %	78 %	76 %	120 %		
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/13/90	45 %	60 %	59 %	87 %		
245-43	R7C-SAL-1	11/30/90	12/13/90	56 %	81 %	78 %	120 %		
245-44	R7-SAL-2	11/30/90	12/13/90	73 %	86 %	83 %	130 %		
245-45	R5C-SAL-1	11/30/90	12/13/90	69 %	85 %	82 %	120 %		
245-46	R5C-SAL-2	11/30/90	12/13/90	23 %	70 %	84 %	130 %		
245-47	R4D-SAL-1	11/30/90	12/13/90	66 %	80 %	78 %	120 %		
245-48	R4D-SAL-2	11/30/90	12/13/90	67 %	85 %	81 %	120 %		
245-49	R7D-SAL-1	11/30/90	12/13/90	62 %	87 %	86 %	140 %		
245-50	R7D-SAL-2	11/30/90	12/13/90	62 %	85 %	82 %	130 %		

U indicates analyte not detected at detection limit shown
B indicates analyte present in blank associated with that sai
NA indicates not applicable

PAH MATRIX SPIKE PERCENT RECOVERIES cl# 245

Battelle Code	Sponsor Code	Date Ext'd	Date Anal'd	% Moist.	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo[a] Anthra-cene	Benzo[b] Fluor-anthene	Benzo[k] Fluor-anthene	Benzo[a] pyrene	Benzo-(g,h,i)-perylene
Matrix spike	RSA-SPA-1,2,3	11/28/90	12/11/90	NA	105 %	107 %	114 %	119 %	111 %	103 %	104 %	109 %
Matrix Spike Dup	RSA-SPA-1,2,3	11/28/90	12/11/90	NA	114 %	114 %	128 %	129 %	117 %	114 %	114 %	119 %
Matrix spike	R9B-SCI-1,2,3	11/29/90	12/12/90	NA	106 %	97 %	111 %	117 %	107 %	101 %	100 %	91 %
Matrix Spike Dup	R9B-SCI-1,2,3	11/29/90	12/12/90	NA	103 %	103 %	114 %	120 %	108 %	102 %	98 %	88 %
Matrix spike	R9A-SCI, 1,2,3	11/30/90	12/13/90	NA	96 %	99 %	107 %	95 %	93 %	92 %	94 %	110 %
Matrix Spike Dup	R9A-SCI, 1,2,3	11/30/90	12/13/90	NA	91 %	91 %	101 %	100 %	91 %	89 %	87 %	92 %

PAH MATRIX SPIKE PERCENT RECOVERIES

PAH MATRIX SPIKE PERCENT RECOVERIES

Battelle Code	Sponsor Code	Date Ext'd	Date Anal'd	Chrysene	Dibenzo-(a,h)-anthracene	Fluor-anthene	Fluorene	Indeno-1,2,3-Pyrene	2-Methyl-Naphthene	Naph-thalene	Phenan-threne	Pyrene
Matrix spike	RSA-SPA-1,2,3	11/28/90	12/11/90	99 %	105 %	113 %	111 %	110 %	NA	29 %	128 %	109 %
Matrix Spike Dup	RSA-SPA-1,2,3	11/28/90	12/11/90	108 %	129 %	129 %	134 %	123 %	NA	114 %	144 %	124 %
Matrix spike	R9B-SCI-1,2,3	11/29/90	12/12/90	103 %	118 %	143 %	128 %	101 %	NA	45 %	128 %	139 %
Matrix Spike Dup	R9B-SCI-1,2,3	11/29/90	12/12/90	104 %	112 %	123 %	124 %	102 %	NA	65 %	128 %	116 %
Matrix spike	R9A-SCI, 1,2,3	11/30/90	12/13/90	84 %	99 %	104 %	105 %	110 %	NA	84 %	102 %	101 %
Matrix Spike Dup	R9A-SCI, 1,2,3	11/30/90	12/13/90	86 %	75 %	94 %	101 %	94 %	NA	82 %	94 %	92 %

PAH MATRIX SPIKE PERCENT RECOVERIES

SURROGATE PERCENT RECOVERIES

Battelle Code	Sponsor Code	Date Ext'd	Date Anal'd	Naph- d8	Acen- d10	Phenan- d10?Q	B[a]P- d12
Matrix spike	RSA-SPA-1,2,3	11/28/90	12/11/90	57 %	64 %	59 %	89 %
Matrix Spike Dup	RSA-SPA-1,2,3	11/28/90	12/11/90	23 %	49 %	50 %	78 %
Matrix spike	R9B-SCI-1,2,3	11/29/90	12/12/90	13 %	35 %	53 %	100 %
Matrix Spike Dup	R9B-SCI-1,2,3	11/29/90	12/12/90	36 %	63 %	73 %	110 %
Matrix spike	R9A-SCI, 1,2,3	11/30/90	12/13/90	54 %	79 %	77 %	140 %
Matrix Spike Dup	R9A-SCI, 1,2,3	11/30/90	12/13/90	59 %	81 %	78 %	110 %

PLANT BUTYLTIN RESULTS

(Concentrations in ug/kg Dry Weight, ppm)

Battelle Code	Sponsor Code	Date Extracted	TETRABUTYL TIN	TRIBUTYL TIN	DIBUTYL TIN	MONOBUTYL TIN	SURROGATE RECOVERY TRIPENYLTIN
245-1	R5B-SPA	12/21/90	4.1 U	4.5 U	3.8 U	3.8 U	76%
245-2	R4B-SPA	12/21/90	4.2 U	4.6 U	3.9 U	3.9 U	78%
245-3	R7A-SPA	12/21/90	4.1 U	4.4 U	3.8 U	3.8 U	74%
245-4,5,6,	R2A-SPA-1,2,3	12/21/90	2.3 U	2.5 U	2.2 U	2.2 U	65%
245-7	R1A-SPA	1/15/91	4.7 U	9.2	4.3 U	19.8	89%
245-8,9	R2B-SPA-1,2	12/21/90	3.1 U	3.4 U	2.9 U	2.9 U	62%
245-10	RID-SAL-1	1/15/91	3.2 U	7.4	2.9 U	21.1	89%
245-11	RID-SAL-2	12/21/90	4.1 U	4.5 U	3.9 U	3.9 U	70%
245-12,14	RIC-SAL-1,3	12/21/90	1.6 U	1.8 U	1.5 U	1.5 U	65%
245-13,15	RIC-SAL-2,4	12/21/90	4.5 U	4.9 U	4.3 U	4.2 U	66%
245-16,18	R2D-SAL-1,3	1/15/91	3.2 U	7.4 B	2.9 U	12.5 B	89%
245-17,19	R2D-SAL-2,4	12/21/90	2.8 U	3.0 U	2.6 U	2.6 U	76%
245-20,21	R13C-TYP-1,2	12/21/90	3.2 U	3.6 U	3.0 U	3.0 U	46%
245-22,23	R13B-TYP-1,2	2/28/91	14.7 B	6.8 B	4.1 B	5.5 B	82%
245-24,25	R13D-TYP-1,2	2/28/91	18.3 B	4.3 B	2.3 B	3.3 B	82%
245-26	R13A-TYP	2/28/91	13.1 B	8.4 B	4.4 B	7.0 B	89%
245-27	R10D-TYP	2/28/91	6.3 B	2.2 B	3.7 B	14.0 B	92%
245-28	R10A-TYP	2/28/91	11.4 B	4.7 B	2.5 B	9.5 B	85%
245-29	R10C-TYP	2/28/91	11.0 B	3.9 B	2.8 B	2.2 U	83%
245-30,31	R10B-TYP-1,2	2/28/91	6.1 B	5.7 B	3.0 B	4.1 B	87%
245-32	R7B-SPA	12/21/90	3.3 U	3.6 U	3.1 U	3.1 U	51%
245-33	R1B-SPA	12/21/90	3.3 U	3.7 U	3.1 U	3.1 U	56%
245-34,35,36 REP 1	R9B SCI-1,2,3 REP 1	1/15/91	3.2 U	6.5 B	2.9 U	2.9 U	92%
245-37	R9C-SCI	1/15/91	3.8 U	8.4 B	3.6	5.0	93%
245-38,39	R9D-SCI-1,2	1/15/91	5.1 U	14.7 B	6.7	4.6 U	84%
245-40,41,42 REP 1	R9A-SCI-1,2,3 REP 1	1/15/91	6.1	8.3 B	4.6	4.3	85%
245-43	R7C-SAL-1	1/15/91	8.2	9.6 B	5.6	6.1	89%
245-44	R7-SAL-2	1/15/91	7.4 U	18.0 B	131.8	25.1	89%
245-45	R5C-SAL-1	1/15/91	2.9 U	6.0 B	2.7 U	18.1	85%
245-46	R5C-SAL-2	1/15/91	6.9 U	16.5 B	12.9	6.3 U	89%
245-47	R4D-SAL-1	1/15/91	3.2 U	7.0 B	2.9 U	17.6	89%
245-48	R4D-SAL-2	1/15/91	7.4 U	18.1 B	11.8	17.7	92%
245-49	R7D-SAL-1	1/15/91	5.8 U	12.6 B	13.2	5.3 U	91%
245-50	R7D-SAL-2	1/15/91	6.0 U	13.3 B	16.6	5.4 U	89%
PROCEDURAL BLANK		12/21/90	5.8 U	6.4 U	6.4 U	5.3 U	38%
PROCEDURAL BLANK		1/15/91	4.2 U	7.9	3.8 U	3.8 U	85%
PROCEDURAL BLANK		2/28/91	4.7	6.5	2.6	5.9	75%

B indicates analyte detected in blank. Note, blanks for specific samples are identified by corresponding "extraction date".
U indicates analyte not detected at detection limit shown

MATRIX SPIKE RECOVERIES

(Concentrations in ug/kg Dry Weight, ppm)

	Sponsor Code		TETRABUTYL TIN	TRIBUTYL TIN	DIBUTYL TIN	MONOBUTYL TIN	SURROGATE RECOVERY TRIPENYLTIN
Sample Concentration:	R9B-SCI-1,2,3 REP 1	12/21/90	3.2 U	6.5	2.9 U	2.9 U	92%
Amount Spiked:			893.0	893.0	893.0	893.0	
Amount Recovered:			600.1	701.1	692.2	194.1	
Percent Recovery :			67%	78%	77%	22%	87%
Sample Concentration:	R1A-SPA	1/15/91	4.7 U	9.2	4.3 U	19.8	89%
Amount Spiked:			1087.0	1087.0	1087.0	1087.0	
Amount Recovered:			624.5	885.4	852.3	178.6	
Percent Recovery :			75%	81%	78%	15%	87%

PLANT PCB RESULTS
(Concentrations in ug/Kg Dry Weight, ppb)

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	% Moist.	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	SURROGATE DBC
BLANK 1	BLANK 1	11/28/90	12/3/90	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	92 %
245-1	R5B-SPA	11/28/90	12/3/90	86	100 U	100 U	100 U	100 U	100 U	100 U	100 U	102 %
245-2	R4B-SPA	11/28/90	12/3/90	85	100 U	100 U	100 U	100 U	100 U	100 U	100 U	68 %
245-3	R7A-SPA	11/28/90	12/3/90	81	100 U	100 U	100 U	100 U	100 U	100 U	100 U	65 %
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	80	100 U	100 U	100 U	100 U	100 U	100 U	100 U	56 %
245-7	R1A-SPA	11/28/90	12/3/90	82	100 U	100 U	100 U	100 U	100 U	100 U	100 U	61 %
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	85	100 U	100 U	100 U	100 U	100 U	100 U	100 U	82 %
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	72 %
245-10	RID-SAL-1	11/28/90	12/4/90	73	100 U	100 U	100 U	100 U	100 U	100 U	100 U	79 %
245-11	RID-SAL-2	11/28/90	12/4/90	91	100 U	100 U	100 U	100 U	100 U	100 U	100 U	153 %
245-12,14	RIC-SAL-1,3	11/28/90	12/4/90	72	100 U	100 U	100 U	100 U	100 U	100 U	100 U	82 %
245-13,15	RIC-SAL-2,4	11/28/90	12/4/90	89	100 U	100 U	100 U	100 U	100 U	100 U	100 U	86 %
245-16,18	R2D-SAL-1,3	11/28/90	12/4/90	73	100 U	100 U	100 U	100 U	100 U	100 U	100 U	90 %
245-17,19	R2D-SAL-2,4	11/28/90	12/4/90	85	100 U	100 U	100 U	100 U	100 U	100 U	100 U	144 %
BLANK 2	BLANK 2	11/29/90	12/4/90	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	78 %
245-20,21	R13C-TYP-1,2	11/29/90	12/4/90	86	100 U	100 U	100 U	100 U	100 U	100 U	100 U	68 %
245-22,23	R13B-TYP-1,2	11/29/90	12/4/90	88	100 U	100 U	100 U	100 U	100 U	100 U	100 U	99 %
245-24,25	R13D-TYP-1,2	11/29/90	12/4/90	81	100 U	100 U	100 U	100 U	100 U	100 U	100 U	46 %
245-26	R13A-TYP	11/29/90	12/4/90	90	100 U	100 U	100 U	100 U	100 U	100 U	100 U	67 %
245-17	R10D-TYP	11/29/90	12/4/90	88	100 U	100 U	100 U	100 U	100 U	100 U	100 U	99 %
245-28	R10A-TYP	11/29/90	12/4/90	85	100 U	100 U	100 U	100 U	100 U	100 U	100 U	51 %
245-29	R10C-TYP	11/29/90	12/4/90	81	100 U	100 U	100 U	100 U	100 U	100 U	100 U	75 %
245-30,31	R10B-TYP-1,2	11/29/90	12/4/90	82	100 U	100 U	100 U	100 U	100 U	100 U	100 U	67 %
245-32	R7B-SPA	11/29/90	12/4/90	80	100 U	100 U	100 U	100 U	100 U	100 U	100 U	82 %
245-33	R1B-SPA	11/29/90	12/5/90	86	100 U	100 U	100 U	100 U	100 U	100 U	100 U	65 %
245-33	R1B-SPA	11/29/90	12/5/90	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	77 %
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	77	100 U	100 U	100 U	100 U	100 U	100 U	100 U	39 %
245-37	R9C-SCI	11/29/90	12/5/90	80	100 U	100 U	100 U	100 U	100 U	100 U	100 U	40 %
BLANK 3	BLANK 3	11/30/90	12/5/90	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	63 %
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	82	100 U	100 U	100 U	100 U	100 U	100 U	100 U	66 %
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	78 %
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	75	100 U	100 U	100 U	100 U	100 U	100 U	100 U	66 %
245-43	R7C-SAL-1	11/30/90	12/5/90	78	100 U	100 U	100 U	100 U	100 U	100 U	100 U	85 %
245-44	R7-SAL-2	11/30/90	12/5/90	93	100 U	100 U	100 U	100 U	100 U	100 U	100 U	83 %
245-45	R5C-SAL-2	11/30/90	12/5/90	74	100 U	100 U	100 U	100 U	100 U	100 U	100 U	83 %
245-46	R5C-SAL-1	11/30/90	12/5/90	89	100 U	100 U	100 U	100 U	100 U	100 U	100 U	95 %
245-47	R4D-SAL-1	11/30/90	12/5/90	76	100 U	100 U	100 U	100 U	100 U	100 U	100 U	77 %
245-48	R4D-SAL-2	11/30/90	12/5/90	88	100 U	100 U	100 U	100 U	100 U	100 U	100 U	82 %
245-49	R7D-SAL-1	11/30/90	12/6/90	80	100 U	100 U	100 U	100 U	100 U	100 U	100 U	70 %
245-50	R7D-SAL-2	11/30/90	12/6/90	89	100 U	100 U	100 U	100 U	100 U	100 U	100 U	86 %

U indicates analyte not detected above detection limit shown.
NA indicates not applicable

PESTICIDE RESULTS
(Concentrations in ug/Kg Dry Weight, ppb)

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	% Moist.	Aldrin	Alpha-BHC	Beta-BHC	Delta-BHC	Gamma-BHC	Chlordane	4,4'-DDD
BLANK 1	BLANK 1	11/28/90	12/3/90	NA	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-1	R5B-SPA	11/28/90	12/3/90	86	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-2	R4B-SPA	11/28/90	12/3/90	85	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-3	R7A-SPA	11/28/90	12/3/90	81	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	80	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-7	R1A-SPA	11/28/90	12/3/90	82	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	85	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	NA	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-10	RID-SAL-1	11/28/90	12/4/90	73	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-11	RID-SAL-2	11/28/90	12/4/90	91	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-12,14	RIC-SAL-1,3	11/28/90	12/4/90	72	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-13,15	RIC-SAL-2,4	11/28/90	12/4/90	89	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-16,18	R2D-SAL-1,3	11/28/90	12/4/90	73	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-17,19	R2D-SAL-2,4	11/28/90	12/4/90	85	20 U	20 U	20 U	20 U	20 U	30 U	20 U
BLANK 2	BLANK 2	11/29/90	12/4/90	NA	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-20,21	R13C-TYP-1,2	11/29/90	12/4/90	86	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-22,23	R13B-TYP-1,2	11/29/90	12/4/90	88	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-24,25	R13D-TYP-1,2	11/29/90	12/4/90	81	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-26	R13A-TYP	11/29/90	12/4/90	90	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-17	R10D-TYP	11/29/90	12/4/90	88	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-28	R10A-TYP	11/29/90	12/4/90	85	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-29	R10C-TYP	11/29/90	12/4/90	81	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-30.31	R10B-TYP-1,2	11/29/90	12/4/90	82	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-32	R7B-SPA	11/29/90	12/4/90	80	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-33	R1B-SPA	11/29/90	12/5/90	86	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-33	R1B-SPA	11/29/90	12/5/90	NA	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	77	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-37	R9C-SCI	11/29/90	12/5/90	80	20 U	20 U	20 U	20 U	20 U	30 U	20 U
BLANK 3	BLANK 3	11/30/90	12/5/90	NA	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	82	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	NA	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	75	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-43	R7C-SAL-1	11/30/90	12/5/90	78	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-44	R7-SAL-2	11/30/90	12/5/90	93	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-45	R5C-SAL-2	11/30/90	12/5/90	74	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-46	R5C-SAL-1	11/30/90	12/5/90	89	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-47	R4D-SAL-1	11/30/90	12/5/90	76	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-48	R4D-SAL-2	11/30/90	12/5/90	88	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-49	R7D-SAL-1	11/30/90	12/6/90	80	20 U	20 U	20 U	20 U	20 U	30 U	20 U
245-50	R7D-SAL-2	11/30/90	12/6/90	89	20 U	20 U	20 U	20 U	20 U	30 U	20 U

U indicates analyte not detected above detection limit shown.
NA indicates not applicable

PESTICIDE RESULTS
(Concentrations in ug/Kg Dry Weight, ppb)

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	4,4'-DDE	4,4'-DDT	Dieldrin	Endo-sulfan I	Endo-sulfan II	Sulfate	Endrin
BLANK 1	BLANK 1	11/28/90	12/3/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-1	R5B-SPA	11/28/90	12/3/90	20 U	20 U	20 U	20 U	20 U	20 U	670
245-2	R4B-SPA	11/28/90	12/3/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-3	R7A-SPA	11/28/90	12/3/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-7	R1A-SPA	11/28/90	12/3/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-10	RID-SAL-1	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-11	RID-SAL-2	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-12,14	RIC-SAL-1,3	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-13,15	RIC-SAL-2,4	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-16,18	R2D-SAL-1,3	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-17,19	R2D-SAL-2,4	11/28/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
BLANK 2	BLANK 2	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-20,21	R13C-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-22,23	R13B-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	27	20 U
245-24,25	R13D-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-26	R13A-TYP	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-17	R10D-TYP	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-28	R10A-TYP	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-29	R10C-TYP	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-30 31	R10B-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-32	R7B-SPA	11/29/90	12/4/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-33	R1B-SPA	11/29/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-33	R1B-SPA	11/29/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-37	R9C-SCI	11/29/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
BLANK 3	BLANK 3	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-43	R7C-SAL-1	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-44	R7-SAL-2	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-45	R5C-SAL-2	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-46	R5C-SAL-1	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-47	R4D-SAL-1	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-48	R4D-SAL-2	11/30/90	12/5/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-49	R7D-SAL-1	11/30/90	12/6/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U
245-50	R7D-SAL-2	11/30/90	12/6/90	20 U	20 U	20 U	20 U	20 U	20 U	20 U

U indicates analyte not detected above detection limit show
NA indicates not applicable

PESTICIDE RESULTS
(Concentrations in ug/Kg Dry Weight, ppb)

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	Endrin Aldehyde	Heptachlor	Heptachlor Epoxide	Methoxy-chlor	Toxaphene	SURROGATE DBC
BLANK 1	BLANK 1	11/28/90	12/3/90	20 U	20 U	20 U	30 U	200 U	92 %
245-1	R5B-SPA	11/28/90	12/3/90	20 U	20 U	20 U	30 U	200 U	102 %
245-2	R4B-SPA	11/28/90	12/3/90	20 U	20 U	20 U	30 U	200 U	68 %
245-3	R7A-SPA	11/28/90	12/3/90	20 U	20 U	20 U	30 U	200 U	65 %
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	20 U	20 U	20 U	30 U	200 U	56 %
245-7	R1A-SPA	11/28/90	12/3/90	20 U	20 U	20 U	30 U	200 U	61 %
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	82 %
245-8,9	R2B-SPA-1,2	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	72 %
245-10	RID-SAL-1	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	79 %
245-11	RID-SAL-2	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	153 %
245-12,14	RIC-SAL-1,3	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	82 %
245-13,15	RIC-SAL-2,4	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	86 %
245-16,18	R2D-SAL-1,3	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	90 %
245-17,19	R2D-SAL-2,4	11/28/90	12/4/90	20 U	20 U	20 U	30 U	200 U	144 %
BLANK 2	BLANK 2	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	78 %
245-20,21	R13C-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	68 %
245-22,23	R13B-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	99 %
245-24,25	R13D-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	46 %
245-26	R13A-TYP	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	67 %
245-17	R10D-TYP	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	99 %
245-28	R10A-TYP	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	51 %
245-29	R10C-TYP	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	75 %
245-30,31	R10B-TYP-1,2	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	67 %
245-32	R7B-SPA	11/29/90	12/4/90	20 U	20 U	20 U	30 U	200 U	82 %
245-33	R1B SPA	11/29/90	12/5/90	20 U	20 U	20 U	30 U	200 U	65 %
245-33	R1B-SPA	11/29/90	12/5/90	20 U	20 U	20 U	30 U	200 U	77 %
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	20 U	20 U	20 U	30 U	200 U	39 %
245-37	R9C-SCI	11/29/90	12/5/90	20 U	20 U	20 U	30 U	200 U	40 %
BLANK 3	BLANK 3	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	63 %
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	66 %
245-38,39	R9D-SCI-1,2	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	78 %
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	66 %
245-43	R7C-SAL-1	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	85 %
245-44	R7-SAL-2	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	83 %
245-45	R5C-SAL-2	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	83 %
245-46	R5C-SAL-1	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	95 %
245-47	R4D-SAL-1	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	77 %
245-48	R4D-SAL-2	11/30/90	12/5/90	20 U	20 U	20 U	30 U	200 U	82 %
245-49	R7D-SAL-1	11/30/90	12/6/90	20 U	20 U	20 U	30 U	200 U	70 %
245-50	R7D-SAL-2	11/30/90	12/6/90	20 U	20 U	20 U	30 U	200 U	86 %

U indicates analyte not detected above detection limit show
NA indicates not applicable

PESTICIDE MATRIX SPIKE RECOVERIES

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	% Moist.	Aldrin	Alpha-BHC	Beta-BHC	Delta-BHC	Gamma-BHC	Chlordane	4,4'-DDD
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	NA	71 %	NA	NA	NA	NA	NA	NA
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	NA	88 %	NA	NA	NA	NA	NA	NA
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	NA	79 %	NA	NA	NA	NA	NA	NA
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	NA	102 %	NA	NA	NA	NA	NA	NA
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	NA	105 %	NA	NA	NA	NA	NA	NA
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	NA	99 %	NA	NA	NA	NA	NA	NA

PESTICIDE MATRIX SPIKE RECOVERIES

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	4,4'-DDE	4,4'-DDT	Dieldrin	Endo-sulfan I	Endo-sulfan II	Sulfate	Endrin
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	NA	NA	48 %	NA	NA	NA	NA
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	NA	NA	58 %	NA	NA	NA	NA
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	NA	NA	47 %	NA	NA	NA	NA
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	NA	NA	64 %	NA	NA	NA	NA
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	NA	NA	84 %	NA	NA	NA	NA
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	NA	NA	62 %	NA	NA	NA	NA

PESTICIDE MATRIX SPIKE RECOVERIES

Client Sample ID	Sponsor Code	Date Ext'd	Date Anal'd	Endrin Aldehyde	Heptachlor	Heptachlor Epoxide	Methoxy-chlor	Toxaphene	DBC
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	NA	NA	NA	NA	200 NA	NA
245-4,5,6	R2A-SPA-1,2,3	11/28/90	12/3/90	NA	NA	NA	NA	200 NA	67 %
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	NA	NA	NA	NA	200 NA	46 %
245-34,35,36	R9B-SCI-1,2,3	11/29/90	12/5/90	NA	NA	NA	NA	200 NA	70 %
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	NA	NA	NA	NA	200 NA	66 %
245-40,41,42	R9A-SCI-1,2,3	11/30/90	12/5/90	NA	NA	NA	NA	200 NA	65 %

BUTYLTINS IN SEDIMENTS, PLANTS & TISSUE

Sponsor: SIMMER (McGUFFIE)

(Concentrations in ug/kg dry weight)

MSL Code	Sponsor Code	Tripentyl % Surrogate	Pentylbutyl % Internal	Tetra	Tributyl	Dibutyl	Monobutyl
277- 1-R	SED09-CB	75.47	123.0	1.9 U	3.2	3.3	5.8
277- 2	SED07-CM	98.55	131.6	2.9	2.0	9.6	2.1
277- 3-R	SED01-MR	74.94	133.6	1.3 U	2.3	1.4 U	1.3 U
277- 4-R	SED05-CM	73.13	137.3	1.2 U	3.1	1.7	1.2 U
277- 5-R	SED10-CB	75.68	134.1	1.5 U	3.6	1.6 U	4.7
277- 6-R	SED13-CF	67.43	142.8	0.9 U	1.8	0.9 U	0.9 U
277- 7-R	SED08-CM	75.64	122.7	2.0	2.3	1.4 U	1.3 U
277- 8-R	SED14-BR	73.00	140.4	1.3 U	3.5	1.8	2.4
277- 9-R	SED11-CB	75.35	142.5	0.9 U	33.4	0.9 U	0.9 U
277- 10-R	SED04-CM	86.65	127.5	1.4 U	3.1	2.0	2.3
277- 11	SED02-CM	148.81	142.4	0.5	2.6	3.6	17.0
277- 12-R	SED03-CM	83.58	133.6	3.0	2.6	1.4 U	2.9
277- 13-R	SEDWR09-CM	83.68	135.9	0.8 U	1.3	0.8 U	0.7 U
277- 14	08A-SAL	128.66	145.5	2.4	4.5	2.2	53.5
277- 15	14C-SAL	100.94	155.1	2.4	4.8	2.2	35.1
277- 16	08C-SAL	98.79	134.9	2.0	3.5	11.1	24.6
277- 17	04C-SAL	119.99	140.7	3.2	6.0	19.0	64.3
277- 18	03C-SAL	91.91	126.7	2.2	3.1	6.6	15.6
277- BLK-2		83.66	136.6	3.3	4.8	12.1	24.7
277- 19R	11C-SCI	80.40	144.4	2.2 U	4.1	2.1 U	4.4
277- 20-R	11A-SCI	76.59	118.9	4.1 U	5.6	5.6	3.7 U
277- 21	11B-SCI	129.64	136.8	5.5	5.2	2.6	9.5
277- 22-R	03B-SPA	96.66	111.0	3.6 U	8.3	3.7	5.1
277- 23	04A-SPA	152.9	64.4	2.7	5.2	2.5	NA
277- 24	14A-SCI	178.00	44.0	1.2	2.2	1.1	NA
277- 25-R	14D-SAL	81.97	117.4	3.1 U	4.4	3.0 U	5.6
277- 26-R	02C-SAL	88.17	113.4	9.7	6.5	3.5 U	7.1
277- 27	05D-SAL	74.01	127.2	54.7	35.8	2.3	5.3
277- 28	03D-SAL	74.05	126.2	3.3	4.8	4.4	7.1
227- BLK-4		67.67	133.7	2.2 U	3.9	2.1 U	10.2
277- 29	08D-SAL	61.68	122.9	2.3 U	4.0	2.8	2.1
277- 30	08B-SAL	63.86	136.4	3.1 U	5.3	3.1 U	2.9 U
277- 31-R	08B-SAL	90.86	115.6	3.6 U	5.6	3.6 U	6.4
277 BLANK		75.31	123.8	3.8 U	5.3	3.7 U	8.7
277- 32	03A-SPA	62.55	121.0	2.1 U	2.9	2.1 U	1.9 U
277- 33	05A-SPA	70.21	125.6	2.2 U	5.2	2.2 U	2.0 U
277- 34	R08-SN01	85.92	112.1	1.6 U	3.3	5.0	1.5 U

BUTYLTINS IN SEDIMENTS, PLANTS & TISSUE

Sponsor: SIMMER (McGUFFIE)

(Concentrations in ug/kg dry weight)

MSL Code	Sponsor Code	Tripentyl % Surrogate	Pentylbutyl % Internal	Tetra	Tributyl	Dibutyl	Monobutyl
277- 34 DUP	R08-SN01	80.00	128.8	1.4 U	3.5	4.2	1.7
277- 35	R08-SN02	80.15	134.2	0.6 U	1.4	0.9	1.6
277- 36	R13-CBR1	71.18	132.5	14.6	40.7	30.1	11.8
277- 37	R01-MOR1	69.60	122.2	3.9 U	34.9	9.3	7.8
277- 38	RO1-MOR2	131.20	52.3	5.0 U	38.3	5.0 U	4.6 U

U indicates not detected at detection limit shown

MATRIX SPIKE RESULTS

277-1-C SPIKE		69.36	144.4	168.0	219.6	243.0	37.6
Percent Recovery				35%	46%	51%	7.7%
277-5-C SPIKE		67.29	142.5	149.6	184.6	31.5	123.4
Percent Recovery				34%	41%	7%	28%
277-8-C SPIKE		82.71	125.4	138.4	203.7	260.7	44.8
Percent Recovery				35%	51%	66%	11%
227-BLANK SPIKE		76.42	177.2	294.4	301.6	327.5	221.5
Percent Recovery				58%	59%	65%	43%
277-36 SPIKE		73.86	128.1	1004.6	1153.7	841.8	63.5
Percent Recovery				60%	69%	50%	4%

METALS IN SEDIMENTS, PLANTS & TISSUE

Sponsor: SIMMER (McGUFFIE)

(concentrations in mg/kg dry weight)

MSL Code	Rep	Sponsor ID	Rep	Ag AA	As XRF	Cd AA	(a) Cr AA/XRF	Cu XRF	Hg CVAA	Ni XRF	(a) Pb AA/XRF	(b) Se AA/XRF	Zn XRF
SEDIMENT													
277- 1	REP 1	SED09-CB	REP 1	0.448	19.3	0.28	183.0	68.5	0.383	107.7	85.6	0.41	142.2
277- 1	REP 2	SED09-CB	REP 2	0.446	20.7	0.28	168.0	72.4	0.394	106.6	84.6	0.39	145.5
277- 2		SED07-CM		0.355	10.6	0.33	195.0	67.5	0.469	119.8	33.8	0.33	157.5
277- 3		SED01-MR		1.418	23.7	0.33	174.0	71.6	0.515	102.0	36.3	0.33	137.2
277- 4		SED05-CM		0.660	14.4	0.26	179.0	67.6	0.419	125.9	34.1	0.25	158.4
277- 5		SED10-CB		0.359	17.2	0.56	126.0	67.9	0.321	93.3	47.8	0.91	135.0
277- 6		SED13-CF		0.234	5.36	0.55	110.0	24.2	0.059	32.2	14.0	0.14 U	161.7
277- 7		SED08-CM		0.023	5.29	0.41	224.0	35.9	0.074	72.2	20.9	0.14 U	88.5
277- 8		SED14-BR		0.206	16.9	0.36	193.0	77.3	0.362	122.1	32.5	0.25	164.7
277- 9		SED11-CB		0.350	15.3	0.22	181.0	50.3	0.283	83.3	13.7	0.16	89.8
277-10		SED04-CM		0.143	13.4	0.31	214.0	72.6	0.439	135.5	35.7	0.17	160.1
277-11		SED02-CM		0.372	18.5	0.32	219.0	90.6	0.469	125.4	36.8	0.33	158.9
277-12		SED03-CM		0.479	18.2	0.41	179.0	70.1	0.166	145.2	33.0	0.42	166.1
277-13		SEDWR09-CM		0.194	9.9	0.22	256.0	28.6	0.164	72.7	13.2	0.17	77.8
PLANTS													
277-14	REP 1	08A-SAL		0.003 U	1.3 U	0.13	0.4	9.7	0.024	1.7 U	0.23	1.10 U	27.3
277-14	REP 2	14C-SAL		0.003 U	0.96 U	0.13	0.4	9.2	0.023	2.33	0.34	1.10 U	29.2
277-15	REP 1	14C-SAL		0.003	0.92 U	0.17	3.6	10.1	0.034	3.78	0.99	0.70 U	30.8
277-15	REP 2	14C-SAL		-	-	-	3.9 *	-	-	-	1.27 *	-	-
277-16		08C-SAL		0.007	0.85 U	0.21	0.4	8.7	0.030	1.48	0.92	0.66 U	36.0
277-17		04C-SAL		0.007	1.0 U	0.29	5.9	19.1	0.038	6.29	1.42	0.79 U	45.7
277-18		03C-SAL		0.003 U	1.0	0.05	1.8	8.0	0.016	3.31	0.66	0.65 U	26.6
277-19		11C-SCI		0.003 U	0.79 U	0.16	0.7	15.3	0.018	4.47	0.49	0.56 U	88.7
277-20		11A-SCI		0.003 U	0.87	0.17	2.7	31.1	0.050	6.70	0.87	0.62 U	89.9
277-21		11B-SCI		0.003 U	0.89 U	0.24	4.0	17.4	0.044	9.39	1.03	0.65 U	133.0
277-22		03B-SPA		0.135	1.04	0.12	7.7	13.9	0.025	9.29	1.84	0.64 U	84.9
277-23		04A-SPA		0.107	1.82	0.07	2.5	8.9	0.014	2.05	0.60	0.68 U	60.9
277-24		14A-SCI		0.034	0.79 U	0.08	3.3	7.7	0.038	3.47	1.18	0.58 U	48.4
277-25		14D-SAL		0.009	0.95 U	0.07	1.7	11.4	0.019	1.85	0.71	0.71 U	29.8
277-26		02C-SAL		0.003	0.91 U	0.16	1.8	10.8	0.019	2.47	0.61	2.20 U	40.0
277-27		05D-SAL		0.014	0.88 U	0.06	4.1	11.5	0.018	4.49	0.86	0.66 U	44.3
277-28		03D-SAL		0.009	0.86 U	0.08	2.6	12.0	0.021	5.27	0.93	0.64 U	25.8
277-29		08D-SAL		0.003	0.83 U	0.15	0.4	8.9	0.025	0.93 U	0.38	0.65 U	36.3
277-30		08B-SAL		0.003	0.99 U	0.10	0.5	8.8	0.018	1.47	0.49	0.77 U	57.4
277-31		11D-SCI		0.005	0.84 U	0.13	1.9	13.6	0.028	5.81	0.76	0.61 U	59.3
277-32		03A-SPA		0.217	1.27	0.06	7.2	13.7	0.022	8.76	1.39	0.63 U	98.0
277-33		05A-SPA		0.165	0.99	0.08	8.5	11.4	0.027	9.1	2.04	0.65 U	65.5

METALS IN SEDIMENTS, PLANTS & TISSUE
Sponsor: SIMMER (McGUFFIE)

(concentrations in mg/kg dry weight)

MSL Code	Rep	Sponsor ID	Rep	Ag AA	As XRF	Cd AA	(a) Cr AA/XRF	Cu XRF	Hg CVAA	Ni XRF	(a) Pb AA/XRF	(b) Se AA/XRF	Zn XRF
TISSUES													
277-34		R08-SN01		0.347	11.62	1.03	2.2	93.6	0.180	10.2	1.15	1.33	401.0
277-34		R08-SN01		0.360	9.22	1.03	2.1	74.3	0.172	8.5	1.43	1.04	309.0
277-35		R08-SN02		0.121	2.5	0.34	1.2	23.5	0.055	4.5	0.82	1.47	131.4
277-36		R13-CBR1		1.03	10.79	3.34	4.3	164.1	0.469	5.78	1.89	3.98	273.0
277-37		R01-MOR1		0.819	8.76	3.53	4.0	23.1	0.398	7.74	1.71	4.19	71.7
277-38		R01-MOR2		0.914	8.93	3.45	3.3	20.5	0.304	5.33	1.39	3.52	71.1
Blank				0.019	N/A	0.01 U	0.8	N/A	0.001 U	N/A	N/A	0.14 U	N/A
Blank				0.007	N/A	0.01 U	0.8	N/A	0.001 U	N/A	0.17 U	0.14 U	N/A

U indicates not detected at detection limit shown
N/A indicates not applicable

PESTICIDES IN SED., PLANT & TISSUE & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT) 3HT)

	% Moist.	% Moist.	Aldrin	Alpha-BHC	Beta-BHC	Delta-BHC	Gamma-BHC	Chlor-dane	4,4-DDD	4,4-DDDE	4,4-DDDT	Dieldrin
SEDIMENT												
SEDIMENT METHOD BLANK	N/A	N/A	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 1 SED09-CB	60	60	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.6	3.0 U	3.0 U
277- 2 SED07-CM	55	55	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 3 SED01-MR	47	47	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 4 SED05-CM	45	45	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 5 SED10-CB	72	72	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
277- 6 SED13-CF	33	33	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 7 SED08 CM	38	38	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 8 SED14-BR	34	34	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 9 SED11-CB	32	32	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 10 SED04-CM	54	54	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 11 SED02-CM	49	49	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 12 SED03 CM	57	57	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
277- 13 SEDWR09-CM	19	19	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
PLANTS												
PLANT METHOD BLANK	N/A	N/A	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 14 08A-SAL	89	89	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 15 14C-SAL	89	89	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 16 08C-SAL	86	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 17 04C-SAL	90	90	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 18 03C-SAL	84	84	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.0 U
277- 19 11C-SCI	90	90	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 20 11A-SCI	87	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 21 11B SCI	86	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 22 03B SPA	87	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 23 04A-SPA	87	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 24 14A-SCI	74	74	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 25 14D-SAL	81	81	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 26 02C-SAL	84	84	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 27 05D-SAL	87	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 28 03D-SAL	85	85	2.0 U	2.3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 29 08D-SAL	87	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 30 08B-SAL	86	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 31 11D SCI	88	88	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.0 U
277- 32 03A-SPA	86	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
277- 33 05A-SPA	84	84	2.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

PESTICIDES IN SED., PLANT & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

	% Moist.	Endo-sulfan I	Endo-sulfan I	Endosulfan Sulfate	Endrin	Endrin Aldehyde	Hepta-chlor	Heptachlor Epoxide	Methoxy-chlor	Toxa-phene	PERCENT RECOVERY SURROGATE DBC
SEDIMENT											
SEDIMENT METHOD BLANK	N/A	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	37
277- 1 SED09-CB	60	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	57
277- 2 SED07-CM	55	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	63
277- 3 SED01-MR	47	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	73
277- 4 SED05-CM	45	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	9
277- 5 SED10-CB	72	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	250 U	32
277- 6 SED13-CF	33	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	38
277- 7 SED08-CM	38	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	59
277- 8 SED14-BR	34	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	87
277- 9 SED11-CB	32	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	97
277- 10 SED04-CM	54	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	121
277- 11 SED02-CM	49	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	83
277- 12 SED03 CM	57	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	87
277- 13 SEDWR09-CM	19	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	200 U	92
PLANTS											
PLANT METHOD BLANK	N/A	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	63
277- 14 08A-SAL	89	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	71
277- 15 14C SAL	89	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	132
277- 16 08C-SAL	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	89
277- 17 04C-SAL	90	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	122
277- 18 03C-SAL	84	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	11
277- 19 11C-SCI	90	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	67
277- 20 11A-SCI	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	106
277- 21 11B-SCI	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	113
277- 22 03B SPA	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	121
277- 23 04A-SPA	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	48
277- 24 14A-SCI	74	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	32
277- 25 14D-SAL	81	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	103
277- 26 02C-SAL	84	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	87
277- 27 05D-SAL	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	122
277- 28 03D-SAL	85	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	176
277- 29 08D-SAL	87	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	138
277- 30 08B SAL	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	154
277- 31 11D-SCI	88	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	79
277- 32 03A-SPA	86	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	87
277- 33 05A-SPA	84	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	100 U	75

PESTICIDES IN SED., PLANT & TISSUE ŀ TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT) 3HT)

	% Moist.	% Moist.	Aldrin	Alpha-BHC	Beta-BHC	Delta-BHC	Gamma-BHC	Chlor-dane	4,4-DDD	4,4-DDDE	4,4-DDDT	Dieldrin
TISSUE												
TISSUE METHOD BLANK	N/A	N/A	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 34 R08-SN01	66	66	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 34 R08-SN01	66	66	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U	10 U
277- 35 RO8-SN02	35	35	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 36 R13-CBR1	92	92	10 U	10 U	12 U	24 U	10 U	10 U	10 U	115 U	30 U	16
277- 37 R01-MOR1	85	85	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 38 R01-MOR2	88	88	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

U indicates not detected at detection limits shon limits shown

PESTICIDES IN SED., PLANT & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

	% Moist.	Endo-sulfan I	Endo-sulfan I	Endosulfan Sulfate	Endrin	Endrin Aldehyde	Hepta-chlor	Heptachlor Epoxide	Methoxy-chlor	Toxa-phene	*PERCENT RECOVERY* SURROGATE DBC
TISSUE											
TISSUE METHOD BLANK	N/A	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	67
277- 34 R08-SN01	66	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	111
277- 34 R08-SN01	66	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	157
277- 35 RO8-SN02	35	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	110
277- 36 R13-CBR1	92	10 U	10 U	10 U	18	10 U	42	10 U	10 U	500 U	119
277- 37 R01-MOR1	85	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	130
277- 38 R01-MOR2	88	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	70

U indicates not detected at detection limits sho

PCBs IN SED., PLANT & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

	% Moist.	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	PERCENT RECOVERY SURROGATE DBC
SEDIMENT									
SEDIMENT METHOD BLANK	N/A	30 U	30 U	30 U	30 U	30 U	30 U	30 U	37
277- 1 SED09-CB	60	30 U	30 U	30 U	30 U	30 U	30 U	30 U	57
277- 2 SED07-CM	55	30 U	30 U	30 U	30 U	30 U	30 U	30 U	63
277- 3 SED01-MR	47	30 U	30 U	30 U	30 U	30 U	150	30 U	73
277- 4 SED05-CM	45	30 U	30 U	30 U	30 U	30 U	30 U	30 U	9
277- 5 SED10-CB	72	50 U	50 U	50 U	50 U	50 U	50 U	50 U	32
277- 6 SED13-CF	33	30 U	30 U	30 U	30 U	30 U	30 U	30 U	38
277- 7 SED08-CM	38	30 U	30 U	30 U	30 U	30 U	30 U	30 U	59
277- 8 SED14-BR	34	30 U	30 U	30 U	30 U	30 U	30 U	30 U	87
277- 9 SED11-CB	32	30 U	30 U	30 U	30 U	30 U	30 U	30 U	97
277- 10 SED04-CM	54	30 U	30 U	30 U	30 U	30 U	120	30 U	121
277- 11 SED02-CM	49	30 U	30 U	30 U	30 U	30 U	83	30 U	83
277- 12 SED03-CM	57	30 U	30 U	30 U	30 U	30 U	210	30 U	87
277- 13 SEDWR09-CM	19	30 U	30 U	30 U	30 U	30 U	75	30 U	92
PLANTS									
PLANT METHOD BLANK	N/A	20 U	20 U	20 U	20 U	20 U	20 U	20 U	63
277- 14 08A-SAL	89	20 U	20 U	20 U	20 U	20 U	20 U	20 U	71
277- 15 14C-SAL	89	20 U	20 U	20 U	20 U	20 U	20 U	20 U	132
277- 16 08C-SAL	86	20 U	20 U	20 U	20 U	20 U	20 U	20 U	89
277- 17 04C-SAL	90	20 U	20 U	20 U	20 U	20 U	20 U	20 U	122
277- 18 03C-SAL	84	20 U	20 U	20 U	20 U	20 U	20 U	20 U	11
277- 19 11C-SCI	90	20 U	20 U	20 U	20 U	20 U	20 U	20 U	67
277- 20 11A-SCI	87	20 U	20 U	20 U	20 U	20 U	20 U	20 U	106
277- 21 11B-SCI	86	20 U	20 U	20 U	20 U	20 U	20 U	20 U	113
277- 22 03B-SPA	87	20 U	20 U	20 U	20 U	20 U	20 U	20 U	121
277- 23 04A-SPA	87	20 U	20 U	20 U	20 U	20 U	20 U	20 U	48
277- 24 14A-SCI	74	20 U	20 U	20 U	20 U	20 U	20 U	20 U	32
277- 25 14D-SAL	81	20 U	20 U	20 U	20 U	20 U	20 U	20 U	103
277- 26 02C-SAL	84	20 U	20 U	20 U	20 U	20 U	20 U	20 U	87
277- 27 05D-SAL	87	20 U	20 U	20 U	20 U	20 U	20 U	20 U	122
277- 28 03D-SAL	85	20 U	20 U	20 U	20 U	20 U	20 U	20 U	176
277- 29 08D-SAL	87	20 U	20 U	20 U	20 U	20 U	20 U	20 U	138
277- 30 08B-SAL	86	20 U	20 U	20 U	20 U	20 U	20 U	20 U	154
277- 31 11D-SCI	88	20 U	20 U	20 U	20 U	20 U	20 U	20 U	79
277- 32 03A-SPA	86	20 U	20 U	20 U	20 U	20 U	20 U	20 U	87
277- 33 05A-SPA	84	20 U	20 U	20 U	20 U	20 U	20 U	20 U	75

PCBs IN SED., PLANT & TISSUE
Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

	% Moist.	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	PERCENT RECOVERY SURROGATE DBC
TISSUE									
TISSUE METHOD BLANK	N/A	100 U	100 U	100 U	100 U	100 U	100 U	100 U	67
277- 34 R08-SN01	66	100 U	100 U	100 U	100 U	100 U	100 U	100 U	111
277- 34 R08-SN01	66	100 U	100 U	100 U	100 U	100 U	100 U	100 U	157
277- 35 RO8-SN02	35	100 U	100 U	100 U	100 U	100 U	100 U	100 U	110
277- 36 R13-CBR1	92	100 U	100 U	100 U	100 U	100 U	100 U	100 U	119
277- 37 R01-MOR1	85	100 U	100 U	100 U	100 U	100 U	100 U	100 U	130
277- 38 R01-MOR2	88	100 U	100 U	100 U	100 U	100 U	100 U	100 U	70

U indicates not detected at detection limits sho

PCB and Pesticide Matrix Spike Recoveries

Battelle Code		Sponsor Codes	Aldrin	Dieldrin	Aroclor-1254	Surrogate DBC
277-	12	SED03-CM	61%	113%	79%	
277-	12	SED03-CM	62%	88%	ND	
277-	33	05A-SPA	57%	59%	189%	165%
277-	33	05A-SPA	58%	50%	144%	129%
277-	36	R13-CBR1	107%	80%	83%	116%
277-	36	R13-CBR1	83%	83%	100%	103%

PCBs IN SED., PLANT & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

	% Moist.	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	PERCENT RECOVERY SURROGATE DBC
TISSUE									
TISSUE METHOD BLANK	N/A	100 U	100 U	100 U	100 U	100 U	100 U	100 U	67
277- 34 R08-SN01	66	100 U	100 U	100 U	100 U	100 U	100 U	100 U	111
277- 34 R08-SN01	66	100 U	100 U	100 U	100 U	100 U	100 U	100 U	157
277- 35 RO8-SN02	35	100 U	100 U	100 U	100 U	100 U	100 U	100 U	110
277- 36 R13-CBR1	92	100 U	100 U	100 U	100 U	100 U	100 U	100 U	119
277- 37 R01-MOR1	85	100 U	100 U	100 U	100 U	100 U	100 U	100 U	130
277- 38 R01-MOR2	88	100 U	100 U	100 U	100 U	100 U	100 U	100 U	70

U indicates not detected at detection limits sho

PAHS IN SEDIMENTS, PLANTS & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

Battelle Code	Sponsor Code	% Moist.	Dibenzo-(a,h)-anthracene	Fluor-anthene	Fluorene	Indeno-1,2,3-Pyrene	2-Methyl-Naphthene	Naph-thalene	Phenan-threne	Pyrene
SEDIMENT										
277- 1	SED09-CB	60%	14	74	10 U	51	30	63	20	89
277- 2	SED07-CM	55%	15	120	10 U	87	12	26	45	160
277- 3	SED01-MR	47%	19	190	10 U	99	30	61	94	240
277- 4	SED05-CM	45%	10 U	10 U	10 U	10 U	15	34	10 U	10 U
277- 5	SED10-CB	72%	30	260	10 U	100	48	97	76	240
277- 6	SED13-CF	33%	10 U	49	10 U	14	17	35	20	46
277- 7	SED08-CM	38%	10 U	18	10 U	11	10 U	56	10 U	20
277- 8	SED14-BR	34%	10 U	28	10 U	17	30	59	13	33
277- 9	SED11-CB	32%	10 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U
277- 10	SED04-CM	54%	11	110	10 U	77	25	50	42	140
277- 11	SED02-CM	49%	10	94	10 U	59	27	53	36	120
277- 12	SED03-CM	57%	10 U	54	10 U	43	35	64	25	72
277- 13	SEDWR09-CM	19%	69	490	72	320	20	37	460	630
PLANTS										
277- 14	08A-SAL	89%	10 U	10 U	10 U	10 U	30	90	16	10 U
277- 15	14C-SAL	89%	10 U	10 U	10 U	10 U	32	97	17	10 U
277- 16	08C-SAL	86%	10 U	10 U	10 U	10 U	25	68	20	10 U
277- 17	04C-SAL	90%	10 U	10 U	10 U	10 U	25	73	13	10 U
277- 18	03C-SAL	84%	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
277- 19	11C-SCI	90%	10 U	10 U	10 U	10 U	20 U	50 U	10	10 U
277- 20	11A-SCI	87%	10 U	10 U	10 U	10 U	24	60	18	10 U
277- 21	11B-SCI	86%	10 U	10 U	10 U	10 U	27	76	18	10 U
277- 22	03B-SPA	87%	10 U	10 U	10 U	10 U	29	88	14	10 U
277- 23	04A-SPA	87%	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
277- 24	14A-SCI	74%	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
277- 25	14D-SAL	81%	10 U	10 U	10 U	10 U	24	61	16	10 U
277- 26	02C-SAL	84%	10 U	10 U	10 U	10 U	24	59	22	10 U
277- 27	05D-SAL	87%	10 U	10 U	10 U	10 U	37	120	17	10 U
277- 28	03D-SAL	85%	10 U	10 U	10 U	10 U	28	83	15	10 U
277- 29	08D-SAL	87%	10 U	10 U	10 U	10 U	28	89	15	10 U
277- 30	08B-SAL	86%	10 U	10 U	10 U	10 U	20	60	12	10 U
277- 31	11D-SCI	88%	10 U	10 U	10 U	10 U	25	62	14	10 U
277- 32	03A-SPA	86%	10 U	10 U	10 U	10 U	24	68	14	10 U
277- 33	05A-SPA	84%	10 U	10 U	10 U	10 U	25	68	17	10 U

PAHS IN SEDIMENTS, PLANTS & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

Battelle Code	Sponsor Code	% Moist.	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo[a] Anthra-cene	Benzo[b] Fluor-anthene	Benzo[k] Fluor-anthene	Benzo[a] pyrene	Benzo-(g,h,i)-perylene	Chrysene
SEDIMENT											
277- 1	SED09-CB	60%	10 U	10 U	17	56	83	67	62	65	76
277- 2	SED07-CM	55%	10 U	10 U	16	67	82	72	86	100	71
277- 3	SED01-MR	47%	12	15	38	100	96	82	130	110	100
277- 4	SED05-CM	45%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 5	SED10-CB	72%	19	120	97	150	211	150	130	110	300
277- 6	SED13-CF	33%	10 U	10 U	10 U	29	18	20	22	13	27
277- 7	SED08-CM	38%	10 U	10 U	10 U	10 U	15	11	11	15	15
277- 8	SED14-BR	34%	10 U	10 U	10 U	11	18	13	16	21	16
277- 9	SED11-CB	32%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 10	SED04-CM	54%	10 U	10 U	15	47	67	50	80	88	53
277- 11	SED02-CM	49%	10 U	10 U	15	41	58	44	63	68	51
277- 12	SED03-CM	57%	10 U	10 U	10 U	22	40	26	39	53	27
277- 13	SEDWR09-CM	19%	27	86	230	290	250	250	410	350	270
PLANTS											
277- 14	08A-SAL	89%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 15	14C-SAL	89%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 16	08C-SAL	86%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 17	04C-SAL	90%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 18	03C-SAL	84%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 19	11C-SCI	90%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 20	11A-SCI	87%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 21	11B-SCI	86%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 22	03B-SPA	87%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 23	04A-SPA	87%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 24	14A-SCI	74%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 25	14D-SAL	81%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 26	02C-SAL	84%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 27	05D-SAL	87%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 28	03D-SAL	85%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 29	08D-SAL	87%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 30	08B-SAL	86%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 31	11D-SCI	88%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 32	03A-SPA	86%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 33	05A-SPA	84%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

PAHS IN SEDIMENTS, PLANTS & TISSUE

Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

Battelle Code	Sponsor Code	% Moist.	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo[a] Anthra-cene	Benzo[b] Fluor-anthene	Benzo[k] Fluor-anthene	Benzo[a] pyrene	Benzo-(g,h,i)-perylene	Chrysene
TISSUE											
277- 34	R08-SN01	66%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 34 DUP	R08-SN01	66%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 35	RO8-SN02	35%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 36	R13-CBR1	92%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 37	R01-MOR1	85%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
277- 38	R01-MOR2	88%	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BLANK	BLANK	N/A	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BLANK	BLANK	N/A	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

U indicates not detected at detection limit shown

PAHS IN SEDIMENTS, PLANTS & TISSUE
Sponsor: SIMMER (McGUFFIE)

(CONCENTRATIONS IN UG/KG WET WEIGHT)

Battelle Code	Sponsor Code	% Moist.	Dibenzo-(a,h)-anthracene	Fluor-anthene	Fluorene	Indeno-1,2,3-Pyrene	2-Methyl-Naphthene	Naph-thalene	Phenan-threne	Pyrene
TISSUE										
277- 34	R08-SN01	66%	10 U	10 U	10 U	10 U	30 U	60 U	10 U	10 U
277- 34 DUP	R08-SN01	66%	10 U	10 U	10 U	10 U	30 U	60 U	10 U	10
277- 35	RO8-SN02	35%	10 U	11	10 U	10 U	30 U	60 U	10 U	10 U
277- 36	R13-CBR1	92%	10 U	10 U	10 U	10 U	30 U	220	10 U	10 U
277- 37	R01-MOR1	85%	10 U	10 U	10 U	10 U	45	120	37	26
277- 38	R01-MOR2	88%	10 U	10 U	10 U	10 U	30 U	61	14	10 U
BLANK	BLANK	N/A	10 U	10 U	10 U	10 U	20 U	50 U	10 U	10 U
BLANK	BLANK	N/A	10 U	10 U	10 U	10 U	30 U	60 U	10 U	10 U

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14. ABSTRACT

The importance of wetlands to the productivity of estuaries has been realized in the San Francisco Bay Area. A heightened public interest has emerged to restore wetland acreage that has dwindled away over the past 50 years. Dredged material was thought to be of potential value in wetland creation or restoration. This report presents the results of a field survey of existing wetland sites in the San Francisco Bay Area. Dominant plants, of existing wetland sites in the San Francisco Bay Area. Dominant plants, animals (where present) and wetland soil from selected marine and estuarine wetlands were sampled and analyzed for contaminants. These data will be used to establish a wetland reference database. Sediment biological and chemical test results concentrations will be compared to the reference database to evaluate its potential use in wetland creation.

15. SUBJECT TERMS

Animal tissue concentrations	Heavy models	PCBs	Wetlands
Field survey	PAHs	Plant tissue concentrations	

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